



Westover Air Reserve Base Chicopee, Massachusetts

Installation-Wide Environmental Monitoring Program

Final Work Plan

July 1998



MONTGOMERY WATSON

WORK PLAN
INSTALLATION-WIDE ENVIRONMENTAL MONITORING PROGRAM
WESTOVER AIR RESERVE BASE
CHICOPEE, MASSACHUSETTS

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LIST OF ACRONYMS AND ABBREVIATIONS

ACM	asbestos containing material
AFB	Air Force Base
AFRC	Air Force Reserve Command
ARAR	Applicable or Relevant and Appropriate Requirement
ARB	Air Reserve Base
ATG	Allied Technology Group, Inc.
bgs	below ground surface
CMR	Code of Massachusetts Regulations
CO	Contracting Officer
CRA	Comprehensive Remedial Actions
ECS	Environmental Compliance Services, Inc.
EPA	Environmental Protection Agency
eV	Electron Volt
FSP	Field Sampling Plan
FTA	Fire Training Area
HQ	Headquarters
IDW	Investigation-Derived Waste
IRP	Installation Restoration Program
IWTP	industrial waste treatment plant
LSP	Licensed Site Professional
MADEP	Massachusetts Department of Environmental Protection
MATS	Military Air Transport Service
MAW	Military Airlift Wing
MCP	Massachusetts Contingency Plan
NOAA	National Oceanic Atmospheric Administration
NSR	No Significant Risk
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PID	Photoionization Detector
POC	Points of Contact
PP	Priority Pollutant
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Response Action Outcome
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RPM	Remedial Program Manager
SAC	Strategic Air Command
SVOCs	Semi-volatile Organic Compounds
TAT	Turnaround Time
TAW	Tactical Airlift Wing
TBC	To Be Considered
TPH	Total Petroleum Hydrocarbons
USTs	underground storage tanks
VOCs	Volatile Organic Compounds

VPH/EPH Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

Section 1



MONTGOMERY WATSON

1.0 INTRODUCTION

This document presents the *Work Plan* for the Environmental Monitoring Program to be conducted at various Installation Restoration Program (IRP) Sites at Westover Air Reserve Base (ARB) in Chicopee, Massachusetts. This *Work Plan* was prepared as authorized in Task Order Number 5056, Project YTPM 98-7098 of Contract Number F09609-95-D-0001. The contract was issued by the Air Force Reserve Command (AFRC), Dobbins Air Reserve Base Contracting, Dobbins ARB, Georgia.

This *Work Plan* for the Environmental Monitoring Program includes the following sections. Section 1.0 presents an introduction and brief history of the 13 IRP sites selected for environmental monitoring. Section 2.0 presents the scope of work for the project and the rationale for conducting the work. Appendix A presents an addendum to the Quality Assurance Project Plan (QAPP) included in the *Revised Final Work Plan* for the Phase II/Remedial Investigation (RI) at the Jet Test Stand Area (Montgomery Watson, 1997). The QAPP describes the quality assurance/quality control (QA/QC) procedures to be followed for the field and laboratory activities. The Field Sampling Plan (FSP), included in Section 3.0 of the *Revised Final Work Plan* for the Phase II/RI at the Jet Test Stand Area (Montgomery Watson, 1997), does not require revisions for the Environmental Monitoring Program. The FSP describes the specific field sampling procedures and requirements to be followed during the field activities and will be referenced when conducting the field work associated with the Environmental Monitoring Program.

1.1 OBJECTIVES

The objectives of the Environmental Monitoring Program are the following:

- Further characterize the nature, extent, and potential impacts of oil and/or hazardous material at individual IRP sites;
- Close existing data gaps in the chemical nature and lateral and vertical extent of contamination;
- Supplement past sampling at Westover ARB sites to potentially close individual sites; and,
- Determine the need to conduct remedial actions at the sites to address any contamination.

The sites addressed in this *Work Plan* were selected through recommendations made in the *Data Review Summary Report* (Montgomery Watson, 1998) for the Installation-Wide Groundwater Monitoring Assessment.

The Environmental Monitoring Program is being implemented to comply with current requirements of the Massachusetts Contingency Plan (MCP) [Code of Massachusetts Regulations (CMR), 1996], including required use of a Licensed Site Professional (LSP). A Data Report will be prepared for the sites to document information collected during the field activities. The results of the Environmental Monitoring Program will form the basis for determining the need for further action at the selected sites.

Several outcomes are possible upon completion of the Environmental Monitoring Program at individual sites:

- Comprehensive Remedial Actions (CRA) are necessary at a site to achieve a Response Action Outcome (RAO) as described in 310 CMR 40.1000 (MCP, 1996a). A Phase III study for identification, evaluation and selection of CRA alternatives is then necessary to select a remedial action alternative;
- The requirements of a Class A or Class B RAO have been met, and an RAO Statement supported by information provided in previous reports is submitted to the Massachusetts Department of Environmental Protection (MADEP); or
- Continuation of environmental monitoring at a site is necessary until final notice from the MADEP.

1.2 BASE OPERATIONAL HISTORY

Westover ARB is located in Chicopee, Massachusetts, approximately 6 miles north of Springfield (Figure 1-1). Westover is the nation's largest ARB. It currently covers an area of over 2,300 acres (Figures 1-2 and 1-3).

The Base was activated in 1940 as Westover Air Force Base (AFB). During World War II, Westover AFB served as a bomber training base and as a port of embarkation/debarkation. After World War II, the Military Air Transport Service (MATS) was moved to Westover AFB. In 1955, Westover AFB became the largest Strategic Air Command (SAC) facility in the eastern United States and was the home of bomber and tanker aircraft. In 1974, Westover

AFB became Westover ARB when the SAC wing was deactivated and the Base was transferred to the AFRC.

Between 1974 and 1987, Westover ARB had a Tactical Airlift Wing (TAW) based at the facility which included C-123 and C-130 aircraft. In 1987, the aircraft assigned to Westover ARB were changed from 16 C-130E Hercules to 16 C-5A Galaxy aircraft, and the 439th TAW was changed to the 439th Military Airlift Wing (MAW).

1.3 SITE OPERATIONAL HISTORY AND DESCRIPTION

This section discusses the history of operations and provides appropriate site descriptions for the 13 select Westover ARB IRP sites including:

- Landfill A (LF-02)
- Low-Level Radioactive Waste Site (RW-04)
- North Fire Training Area (FT-05)
- Sewage Treatment Plant (WP-06)
- Facility 1900 Leaching Pit (WP-07)
- Incinerator Landfill A (OT-09)
- Construction Rubble Landfill (LF-12)
- Demineralizer Waste Leaching Pit (WP-13)
- Industrial Waste Treatment Plant (WP-15)
- Hangar Apron Area (SS-16)
- Building 9200 (SS-17)
- Aqua Systems Site (SS-19)
- Service Station Building 1601 (SS-20)

1.3.1 Landfill A (LF-02)

Landfill A (LF-02) is located on approximately 12 acres near the northern border of Westover ARB (see Figure 1-4). The site is abutted to the south by a military railway track and further south by the North Fire Training Area (FT-05) and "Dog Patch". Training Avenue separates LF-02 from a forested area and wetlands to the west. Stony Brook and surrounding swamps constitute the east side of the Landfill. The lithologic units underlying

the site consist of surface soils and fill material underlain by deltaic deposits of sand and gravel, varved lacustrine sediments consisting of silts and clays, clayey till, and the Portland Formation. The top of the bedrock is estimated to be at least 100 ft below ground surface (bgs).

Landfill A was operated as a burn-and-bury sanitary landfill from approximately 1958 to 1960. The Landfill received primarily domestic refuse and general refuse including empty containers and drums, as well as ashes from the coal-fired heating plant at Westover ARB. The shallow depth to groundwater forced closure of the Landfill in 1960. The limited amount of fill placed during operation of the Landfill caused only a small rise in topography.

1.3.2 Low-Level Radioactive Waste Site (RW-04)

The Low-Level Radioactive Waste Site (RW-04) is located in the northern portion of Westover ARB, just north of Landfill B and within 100 ft of the installation boundary (see Figure 1-4). The site is bounded to the south by a military railway track, Landfill B, a small arms firing range, and to the east by Landfill A. Surificially, the site is composed of coarse-grained sand covered with sparse brush, grasses, and hardwood trees. Runoff from the northern portion of Westover ARB drains toward Stony Brook through storm sewers. A series of beaver dams on Stony Brook east of RW-04, in the vicinity of Landfill A, create swampy areas locally.

The site was reportedly used a single time between 1952 and 1953 to bury a 6 ft by 6 ft concrete vault containing low level radioactive electron tubes at a depth of six feet. A fence was installed around the site at the time of the vault burial, but was subsequently removed. The area was graded and a large sand berm was constructed along the northern installation boundary. Allied Technology Group, Inc. (ATG) conducted removal activities for the buried vault in 1997 (ATG and Environmental Compliance Services (ECS), 1997). In March 1997, a Class A-1 partial RAO was submitted for the site stating that the soil and surface water in the immediate area of RW-04 do not pose significant risk to human health or the environment (ECS, 1997b).

1.3.3 North Fire Training Area (FT-05)

The North Fire Training Area (FTA) (FT-05) is in an area without boundaries located in the northeast corner of Westover ARB (see Figure 1-4). The North FTA is relatively flat and vegetated with grasses which are maintained in a cut condition, and scattered mature trees. The North FTA is approximately 1,400 ft from the northern installation boundary. Landfill A is located to the north and Landfill B is located to the west of the site. An unpaved access road to the northeast-southwest runway passes through the North FTA. The site is proximate to the Westover ARB obstacle course and contains a former installation water supply well which was redeveloped for use as a groundwater monitoring well in 1987.

The North FTA was reported to have been used intermittently for fire training exercises from approximately 1946 to 1955. Flammable waste petroleum products (lubricating oil and fuels) and solvents are suspected to have been used in the exercises which consisted of spreading the flammables on steel mock-ups of aircraft frames and setting it afire. Fire crews then practiced extinguishing the blaze. The frequency of the fire training exercises and the amounts of hazardous materials used at the North FTA are unknown.

1.3.4 Sewage Treatment Plant (WP-06)

The former Sewage Treatment Plant is located on approximately 57,000 square feet of land in the western section of the installation, west of the main gate on Industrial Road (see Figure 1-5). The average elevation at the site is approximately 240 ft above MSL with slopes less than three percent. Surface drainage flows to the west into the Willimansett Brook watershed. The surrounding area, consisting of grassy lots and other buildings, has been heavily altered by previous development. The west wing of Building No. 5304, a former chemical storage location, is located approximately 30 ft east of the site. A pesticide storage shed, identified as Building No. 5314, was formerly located approximately 50 ft northeast of the site.

The facility processed sewage and industrial wastewater from 1941 to 1970. The sewage treatment operations involved less than five percent industrial wastewater influent during the years between 1955 and 1970. Two former sludge drying beds were demolished and removed during the summer of 1996. The two Imhoff tank structures located at the former

Sewage Treatment Plant are currently being demolished and removed by Montgomery Watson. The tank compartments were filled with water, soil, solid waste, and asbestos containing material (ACM) at one tank location. Asbestos removed during building demolition activities was put in plastic bags, deposited in the Imhoff tank, and covered with dirt fill. The southern Imhoff tank structure is free of debris. Less than 20 pounds of a "cyanide compound" formerly used as a pest-control fumigant was reportedly disposed of at the site in the late 1940s.

1.3.5 Facility 1900 Leaching Pit (WP-07)

The Facility 1900 Leaching Pit Site (WP-07) occupies an area of approximately 1,000 square feet in the northwestern portion of Westover ARB (see Figure 1-6). The Facility is located at the intersection of Inner Drive and Monument Avenue and is surrounded by other Westover ARB Facilities. Facility 1900 Leaching Pit is located within Building 1900. Building 1900 is currently abandoned, and formerly housed a photographic laboratory. Facility 1900 lies in close proximity to a drainage basin divide. Therefore, drainage from the vicinity of the Facility 1900 Leaching Pit Site may be directed west or north, toward Stony Brook. An area located approximately 2,000 ft north of Facility 1900 is designated by the Massachusetts Natural Heritage Endangered Species Program as an Estimated Habitat of Rare Wetland Species.

The Air Force Special Products Production Facility was located at Facility 1900 and operated from 1955 to 1976. The leach field was reportedly used for the disposal of waste acids and laboratory wastes. The quantities of waste acids leached into the ground are unknown. On January 16, 1995, Westover ARB reported a release of approximately 20 gallons of lubricating oil from a filter tank.

1.3.6 Incinerator Landfill A (OT-09)

Incinerator Landfill A (OT-09) was located on a half-acre plot of land in the southernmost portion of Westover ARB (see Figure 1-7). Site OT-09 was located approximately 1,000 ft to the east of the Incinerator Site (OT-14). Incinerator Landfill A is directly south of the main runway and is surrounded by open fields of grass. The site is within 500 ft of the installation boundary and Chicopee Memorial State Park.

Incinerator Landfill A was in operation from 1946 until 1948 and was reported to be the first landfill at the installation. During the period from 1941 to 1958, the primary means of municipal refuse disposal was incineration. Incinerator Landfill A reportedly received mostly incinerator ash and residue and ash from the coal-fired heating plant.

1.3.7 Construction Rubble Landfill (LF-12)

The Construction Rubble Site consists of three separate areas totaling 1,600 square feet and is located in the northern portion of Westover ARB (see Figure 1-8). The site is bordered to the northeast by the military railroad and to the northwest by Stony Brook. The remainder of the surrounding area consists of dirt roads and highly disturbed areas of brush and small trees.

The site was in use since 1971 as a disposal site for rubble, consisting mainly of timber, concrete, asphalt, and various building debris, generated by demolition of barracks and other buildings and for asphalt and concrete debris generated by reconstruction of runways. No hazardous waste is documented to have been disposed within the site. The Construction Rubble Site is no longer being used for disposal. One stockpile of mulch and one stockpile of loam are currently being staged near the Construction Rubble Landfill site.

1.3.8 Demineralizer Waste Leaching Pit (WP-13)

The Demineralizer Waste Leaching Pit (WP-13) is located near the southern boundary of Westover ARB (see Figure 1-9). The site is located approximately 250 ft to the northwest of Facility 7400, the Massachusetts Army National Guard Aviation Support Facility. The leaching pit occupies a small grassy area to the northwest of the parking lot.

The demineralizer system removed high levels of minerals from the installation water supply to be used in the fuel systems of the B-52 bombers and KC-135 tanker aircraft. Two loosely covered standpipes were observed in the area of the site.

1.3.9 Industrial Waste Treatment Plant (WP-15)

The Industrial Waste Treatment Plant (WP-15) is located in the central portion of Westover ARB (see Figure 1-10). The Industrial Waste Treatment Plant (IWTP) is one of the three

sites collectively referred to as Zone 1. The IWTP is centrally located on the installation between taxiways at Facility 7052, southeast of SS-19 and north of SS-16. The site is currently covered with concrete pavement and is within the area used as a parking apron for aircraft. Based on soil boring data, subsurface soils primarily consist of fine to coarse sand and gravel at an average thickness of 5 ft.

The IWTP was built in 1956 and operations were terminated on 30 September 1987. During this period, the IWTP, which had a capacity of 30,000 gallons per day, received waste discharges from Facilities 7051 and 7053. Occasionally, several other industrial operations within the installation used the IWTP for disposal of their drummed waste. The process of wastewater treatment involved separation and settling of grit and heavy particles. Floating oils were skimmed from the above ground settling tank and stored in an adjacent 3,000-gallon concrete skim waste storage tank under Facility 7052. The IWTP was demolished and all associated structures were removed in 1988 concurrently with the apron-taxiway construction. Approximately 12 cubic yards of contaminated soil were removed during decommissioning.

1.3.10 Hangar Apron Area (SS-16)

Hangar Apron Area (SS-16) is located on approximately 12 acres in the south central portion of Westover ARB (see Figure 1-10). The Hangar Apron Area is one of the three sites collectively referred to as Zone 1. The runway is located immediately southeast of the site. The majority of the area is either covered by structures or paved surfaces. The site consists of two hangars (Hangar 7000 and Hangar 7400), pump houses, ramps, apron, taxiways, and grassy areas. Based on soil boring data, subsurface soils primarily consist of fine to coarse sand and gravel at an average thickness of 5 ft.

In 1988, Hangar 7000 was modified to be used for storage and repair of C-5A Galaxies and construction of a new hangar, Hangar 7400, began. Buildings 7700 and 7701, located south of Hangar 7000, operated as fuel pump houses serving fuel pits throughout the installation. A former fuel handling water draw-off was identified as a potential past source. In May 1986, strong petroleum odors were observed during the installation of twenty-four exploratory foundation borings near Building 7000 in preparation for construction of Building 7040, new pump houses, and a hydrant fuel system. The discovery of these

petroleum contaminants prompted additional field work to determine the source of the potential subsurface contamination.

1.3.11 Building 9200 (SS-17)

Building 9200 (SS-17) is a former USAF SAC facility located approximately four miles north-northeast of the installation in Granby, Massachusetts (see Figure 1-11). The site is situated off Highway 202 at the north end of Green Meadow Lane and encompasses approximately 100 acres. The site is bordered on the south and west by residential properties and to the north and east by undeveloped forest and fields. Relief across the site is generally flat; however, runoff from the on-site buildings generally flows to the southeast, towards Ingraham Brook. Ingraham Brook discharges to Bachelor Brook just north of the site.

Acquired by the USAF in 1957, the site served as a remote transmitting station for the installation from 1957 to 1983. The site has been vacant since 1983 and maintained in caretaker status with the intention to sell or transfer the property. Three underground storage tanks (USTs) and two above ground transformers were used at the site. In addition, solvents used for cleaning on-site equipment were reportedly stored on-site. The USTs were removed from the site in October 1991. The transformers have also been removed from the site. On-site water was supplied by a bedrock well located on-site. The well has since been abandoned. Buildings 9200, 9201, and 9202 were demolished and removed from the site in 1997.

1.3.12 Aqua Systems Site (SS-19)

The Aqua Systems Site (SS-19) is located on approximately nine acres in the central portion of Westover ARB, at the southwest end of the main aircraft hangars (see Figure 1-10). The Aqua Systems Site is one of the three sites collectively referred to as Zone 1. The site is bound to the north by a US military railroad, to the south and east by Hangar Street, and to the west by Collins Street. The site consists of three buildings previously used as fuel pump houses for the former USTs which were once located in this area. Grassy areas divided by a dirt road cover the remainder of the site. Based on soil boring data, subsurface soils primarily consist of fine to coarse sand and gravel at an average thickness of 5 ft. The site is relatively flat, sloping very gently to the south.

1.3.13 Former Service Station, Building 1601 (SS-20)

The former Service Station at Building 1601 (SS-20) is approximately one-half acre and is located on the central portion of the installation in the area of Darnell and Patriot Avenue. Building 1601 is the only structure located on-site (see Figure 1-12). The majority of the area surrounding Building 1601 is paved, with the exception of the grassy area behind the building to the northeast, toward the runway ramp. Railroad tracks run behind the building through the grassy area. Relief across SS-20 is very flat. Runoff from the paved area discharges to the installation drainage system. Runoff from the grassy area most likely infiltrates through the subsurface.

The site consists of one building which was used as a gasoline dispensing facility from 1941 to 1991. In 1991, nine USTs used to store gasoline and No. 2 fuel oil were removed from the site. Building 1601 is currently used as the Recreation Supply Building. The facility rents campers, tents, boats, and other recreational items to military personnel.

1.4 PREVIOUS INVESTIGATIONS

Previous investigations conducted at the individual IRP sites are discussed in the *Final Data Review Summary Report* (Montgomery Watson, 1998). Therefore, discussions of the previous investigations conducted at these sites will not be reiterated in this *Work Plan*. Assessment of these previous investigations resulted in the selection of 20 IRP sites requiring further environmental monitoring. This *Work Plan* addresses the 13 sites included in the Environmental Monitoring Program. Environmental monitoring at the seven remaining sites of the 20 IRP sites requiring further sampling will be addressed as part of the separate investigations or remedial actions to be conducted in fiscal year 1998 or 1999 at these sites.

Section 2



MONTGOMERY WATSON

2.0 SCOPE OF WORK

This section describes the tasks to be conducted by Montgomery Watson as part of the Environmental Monitoring Program. Specific field sampling procedures are provided in Section 3 (Field Sampling Plan) of the *Revised Final Work Plan* for the Phase II/RI at the Jet Test Stand Area (Montgomery Watson, 1997). Specific sample handling, QA/QC procedures, and analytical methodologies are presented in Appendix A of this *Work Plan*.

The objectives described in Section 1 will be accomplished by completing the following tasks in accordance with the MCP to meet the project objectives:

- Completing the environmental sampling (i.e., groundwater, soil, surface water, and sediment sampling) for the Environmental Monitoring Program,
- Preparing a Data Report documenting the results of the sampling.

Montgomery Watson has retained the services of Mr. Kevin Sheehan, P.E., of ECS, a small business subcontractor, to provide LSP services required by the MCP. Mr. Sheehan's LSP registration number is 4813.

2.1 ENVIRONMENTAL SAMPLING

The sampling for the Environmental Monitoring Program at the 13 select IRP sites includes the following tasks:

- Collection and analysis of six groundwater samples from the existing site wells and up to four surface soil samples from four locations on Landfill A (LF-02) utilizing direct-push sampling methods.
- Collection and analysis of seven groundwater samples from existing wells at and adjacent to the Low-Level Radioactive Waste Site (RW-04).
- Collection and analysis of one groundwater sample from the existing site well, up to eight soil samples and four shallow groundwater samples from four locations within the former burn area of the North Fire Training Area (FT-05) utilizing direct-push sampling methods.
- Collection and analysis of approximately 14 surface soil samples utilizing direct-push sampling methods or hand augering at the Sewage Treatment Plant (WP-06).

- Collection and analysis of three groundwater samples from existing site wells at Facility 1900 Leaching Pit Site (WP-07).
- Collection and analysis of eight soil samples and four groundwater samples from four locations using direct-push sampling methods at the Incinerator Landfill A Site (OT-09).
- Collection and analysis of nine soil samples and three groundwater samples from nine locations using direct-push sampling methods at the Construction Rubble Landfill Site (LF-12).
- Collection and analysis of two soil samples, one sludge sample, and one direct-push groundwater sample from the former leach pit at the Demineralizer Waste Leaching Pit Site (WP-13).
- Collection and analysis of one groundwater sample from an existing site well at the Industrial Waste Treatment Plant (WP-15).
- Collection and analysis of 13 groundwater samples from existing site wells at the Hangar Apron Area (SS-16).
- Collection and analysis of 11 groundwater samples from existing site wells at Building 9200 (SS-17).
- Collection and analysis of six groundwater samples from existing site wells at the Aqua Systems Site (SS-19).
- Collection and analysis of six groundwater samples from existing site wells at the Former Service Station, Building 1601 Site (SS-20).
- Validation of the new laboratory analytical data.
- Preparation of an Analytical Data Report.
- Management of Investigation-Derived Waste (IDW)

A list of wells to be sampled per site is included as Table 2-1. All tasks will be completed in accordance with applicable requirements of the policy for the investigation, assessment, and remediation of oil and/or hazardous material releases, as outlined in the MCP.

Prior to conducting subsurface intrusive activities, Montgomery Watson will coordinate with the Installation Remedial Program Manager (RPM) to locate and mark all underground utilities in the vicinity of the sites. Montgomery Watson will mark all points of ground penetration and secure an approved work clearance by submitting the Air Force Form 103, Base Civil Engineering Work Clearance Request, for review and approval by Base Civil Engineering. The request for work clearance will be submitted at least two weeks prior to the start of field work.

2.1.1 Landfill A (LF-02) Scope of Work

Because the most recent groundwater sampling conducted at Landfill A was in 1988 and the historical results indicate a potential for total petroleum hydrocarbons (TPH) and metals contamination, groundwater sampling will be conducted at this site. Additionally, collection of soil samples will be conducted to fulfill the requirements of the MCP for potential site closure. Figure 2-1 presents the proposed sampling locations at Landfill A.

Groundwater samples will be collected from the six existing site monitoring wells (A-1, A-2, A-3/3A, and A-4/4A). These wells are located upgradient, downgradient, or within the former landfill area and are situated in both the shallow and deeper portions of the surficial aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts volatile petroleum hydrocarbons (VPH) / extractable petroleum hydrocarbons (EPH) Method, volatile organic compounds (VOCs) by SW-846 Method 8260, ethylene dibromide (EDB) by EPA Method 504, and total and dissolved priority pollutant (PP) metals. Table 2-2 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

In addition to groundwater samples, direct-push surface soil samples will be collected to assess the condition of the soil at the site. Four direct-push surface soil samples will be collected from four proposed locations as shown on Figure 2-1. The Montgomery Watson field geologist will visually inspect the soil samples and will screen each sample with a photoionization detector (PID) equipped with a 10.6 electron volt (eV) lamp for airborne ionizable gases and vapors. The direct-push sampling system will be advanced to the interface of the cover material and landfill material. One soil sample at each boring identified as having the highest PID reading will be collected for laboratory analysis. If no PID readings are observed, one soil sample will be collected at the surface. The soil samples will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, PP metals by SW-846 Methods 6000/7000, pesticides by SW-846 Method 8081, and polychlorinated biphenyls (PCBs) by SW-846 Method 8082. Table 2-2 summarizes the proposed analytical program for the direct-push soil samples collected from the site. All direct-push sample locations will be sealed with bentonite once sampling is complete.

2.1.2 Low-Level Radioactive Waste Site (RW-04) Scope of Work

Due to the elevated gross alpha, beta, and gamma radiation historically detected in the wells in the vicinity of the Low-Level Radioactive Waste Site (RW-04), groundwater sampling will be conducted at this site. Figure 2-1 presents the proposed sampling locations at the Low-Level Radioactive Waste Site.

Groundwater samples will be collected from the seven existing monitoring wells (A-3/3A, B-11, B-17/17A, and B-19/19A). These wells are located upgradient, downgradient, or adjacent to the former source area and are situated in both the shallow and deeper portions of the surficial aquifer. The groundwater samples will be analyzed for gross alpha, gross beta, and gross gamma radiation. Table 2-3 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

2.1.3 North Fire Training Area (FT-05) Scope of Work

Because the only existing site well, NF-1, has not been sampled since 1987, groundwater sampling will be conducted at this site. Additionally, collection of soil samples and shallow groundwater samples will be conducted to characterize the site and determine the need to conduct additional investigations and/or support an RAO for the site. Figure 2-1 presents the proposed sampling locations at the North Fire Training Area.

A groundwater sample will be collected from the one existing site well (NF-1). This bedrock well formerly supplied water to the site. The groundwater sample will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and total and dissolved PP metals. Table 2-4 summarizes the proposed analytical program for the groundwater sample collected from site monitoring wells.

Direct-push soil samples and shallow groundwater samples will be collected to characterize the site and determine the need to conduct additional investigations and/or support an RAO for the site. Eight direct-push soil samples (four shallow and four deeper) and four direct-push groundwater samples will be collected from four proposed locations as shown on Figure 2-1. The Montgomery Watson field geologist will visually inspect the soil samples and will screen each sample with a PID equipped with a 10.6 eV lamp for airborne ionizable gases

and vapors. The direct-push sampling system will be advanced to the groundwater table. Two soil samples at each boring identified as having the highest PID readings will be collected for laboratory analysis. If no PID readings are observed, one soil sample will be collected at the surface and one just above the saturated zone. The eight soil samples will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, PP metals by SW-846 Methods 6000/7000, pesticides by SW-846 Method 8081, and PCBs by SW-846 Method 8082. The four direct-push groundwater samples will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, and total and dissolved PP metals. Table 2-4 summarizes the proposed analytical program for the direct-push samples collected from the site. All direct-push sample locations will be sealed with bentonite once sampling is complete.

2.1.4 Sewage Treatment Plant (WP-06) Scope of Work

Because there is ongoing construction and remedial action at the Sewage Treatment Plant and groundwater contamination has not historically been detected, no groundwater sampling will be conducted at this site. However, collection of soil samples is warranted to determine the presence or absence of cyanide and pesticides in site soil. Figure 2-2 presents the proposed sampling locations at the Sewage Treatment Plant.

Surface soil samples will be collected using direct-push methodology or hand-augering to assess the condition of the soil at the site. Approximately 14 surface soil samples will be collected from the proposed locations as shown on Figure 2-2. The Montgomery Watson field geologist will visually inspect the soil samples. Six of the 14 soil samples collected at the former Sewage Treatment Plant Site will be analyzed for cyanide. The remaining eight soil samples will be analyzed for pesticides by SW-846 Method 8081. Table 2-5 summarizes the proposed analytical program for the soil samples collected from the site. All sample locations will be sealed with bentonite once sampling is complete.

2.1.5 Facility 1900 Leaching Pit (WP-07) Scope of Work

Because groundwater has not been sampled at the Facility 1900 Leaching Pit Site since the release of petroleum product in 1995, groundwater sampling will be conducted at this site. It is unknown whether the leaching pit was abandoned prior to constructing the addition to Building 1900. Therefore, additional groundwater samples are necessary to determine if the

leaching pit has impacted the condition of the site. Figure 2-3 presents the proposed sampling locations at the Facility 1900 Leaching Pit (WP-07).

Groundwater samples will be collected from the three existing site monitoring wells (LF-1, LF-2 and LF-3). These wells are located upgradient, downgradient, or adjacent to the former leaching pit and are situated in the shallow portion of the surficial aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and total and dissolved PP metals. Table 2-6 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

2.1.6 Incinerator Landfill A (OT-09) Scope of Work

The Incinerator Landfill A Site does not have any associated site monitoring wells. Therefore, because of the lack of environmental data available for Incinerator Landfill A, a direct-push soil and groundwater investigation will be conducted to characterize the site and determine the need to conduct additional investigations and/or support an RAO for this site. Figure 2-4 presents the proposed sampling locations at Incinerator Landfill A.

Direct-push soil and groundwater samples will be collected to assess the condition of the site. Eight direct-push soil samples (four shallow and four deeper) and four groundwater samples will be collected from four proposed locations as shown on Figure 2-4. The Montgomery Watson field geologist will visually inspect the soil samples and screen each sample with a PID equipped with a 10.6 eV lamp for airborne ionizable gases and vapors. The direct-push sampling system will be advanced to the groundwater table. Two soil samples at each boring identified as having the highest PID readings will be collected for laboratory analysis. If no PID readings are observed, one soil sample will be collected at the surface and one just above the saturated zone. The eight soil samples will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, PP metals by SW-846 Methods 6000/7000, pesticides by SW-846 Method 8081, and PCBs by SW-846 Method 8082. The four direct-push groundwater samples will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, and total and dissolved PP metals. Table 2-7 summarizes the proposed analytical program for the direct-push samples collected from the site. All direct-push sample locations will be sealed with bentonite once sampling is complete.

2.1.7 Construction Rubble Landfill (LF-12) Scope of Work

The Construction Rubble Landfill Site does not have any associated site monitoring wells. Therefore, because of the lack of environmental data available for the Construction Rubble Site, a direct-push soil and groundwater investigation will be conducted at this site. Figure 2-5 presents the proposed sampling locations at the Construction Rubble Landfill.

Direct-push soil and groundwater samples will be collected to assess the condition of the site. Nine direct-push shallow soil samples and three groundwater samples will be collected from nine proposed locations as shown on Figure 2-5. The Montgomery Watson field geologist will visually inspect the soil samples and will screen each sample with a PID equipped with a 10.6 eV lamp for airborne ionizable gases and vapors. The direct-push sampling system will be advanced to the groundwater table. One soil sample at each boring identified as having the highest PID reading will be collected for laboratory analysis. If no PID readings are observed, one soil sample will be collected at the surface. The nine soil samples will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, semi-volatile organic compounds (SVOCs) by SW-846 Method 8270, PP metals by SW-846 Methods 6000/7000, pesticides by SW-846 Method 8081, and PCBs by SW-846 Method 8082. The three direct-push groundwater samples will be analyzed for VOCs by SW-846 Method 8260, EDB by EPA 504, TPH-VPH/EPH, and total and dissolved PP metals. Table 2-8 summarizes the proposed analytical program for the direct-push samples collected from the site. All direct-push sample locations will be sealed with bentonite once sampling is complete.

2.1.8 Demineralizer Waste Leaching Pit (WP-13) Scope of Work

Because of the presence of the standpipe in the former Demineralizer Waste Leaching Pit, the site requires closure according to the Massachusetts Closure Requirements for Shallow Injection Wells. Additionally, environmental sampling associated with the closure will be conducted, including the collection of two soil samples, one sludge sample, and one direct-push groundwater sample at the outlet of the leach field. Figure 2-6 presents the proposed sampling locations at the Demineralizer Waste Leaching Pit.

Soil, sludge, and groundwater samples will be collected to assess the condition of the site. Two soil samples, one sludge sample, and one groundwater sample will be collected from the proposed locations as shown on Figure 2-6. The Montgomery Watson field geologist will visually inspect the soil samples and will screen each sample with a PID equipped with a 10.6 eV lamp for airborne ionizable gases and vapors. One soil sample identified as having the highest PID reading will be collected for laboratory analysis and one soil sample at the outlet of the former standpipe. If no PID readings are observed, two soil samples will be collected at the outlet of the former standpipe. The two soil samples, one sludge sample, and one groundwater sample will be analyzed for VOCs by SW-846 Method 8260, TPH-VPH/EPH, and PP metals by SW-846 Methods 6000/7000. Table 2-9 summarizes the proposed analytical program for the environmental samples collected from the site. All sample locations will be sealed with bentonite once sampling is complete.

2.1.9 Industrial Waste Treatment Plant (WP-15) Scope of Work

Because the Industrial Waste Treatment Plant site is part of Zone 1 and MADEP's acceptance or rejection of the Zone 1 Phase II/ RI report is pending, groundwater sampling will be conducted at Zone 1 to maintain up-to-date groundwater data. Figure 2-7 presents the proposed sampling locations at Zone 1.

Groundwater samples will be collected from one existing site monitoring well (IW-3). This well is located within the former Industrial Waste Treatment Plant site, downgradient of the Aqua Systems Site, and is situated in the shallow portion of the surficial aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and total and dissolved lead. Table 2-10 summarizes the proposed analytical program for groundwater samples collected from the site monitoring well.

2.1.10 Hangar Apron Area (SS-16) Scope of Work

A Phase II/RI report for Zone 1 was submitted in 1997 by O'Brien & Gere; however, MADEP's acceptance or rejection of the report is pending. Therefore, groundwater sampling will be conducted at Zone 1 to maintain up-to-date groundwater data. Figure 2-7 presents the proposed sampling locations at Zone 1.

Groundwater samples will be collected from 13 existing site monitoring wells (MW-2, MW-11, MW-13, MW-19, MW-36, MW-37, ECS-21, ECS-23, ECS-26, ECS-27, ECS-29, ECS-30, and ECS-31). These wells are located upgradient, downgradient, and adjacent to the former Hangar Apron Area and are situated in the shallow portion of the surficial aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and total and dissolved lead. Table 2-11 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

2.1.11 Building 9200 (SS-17) Scope of Work

Because tetrachloroethene (PCE) has historically been detected in groundwater and TPH-VPH/EPH has never been analyzed for in groundwater at site SS-17, groundwater sampling will be conducted at Building 9200. Figure 2-8 presents the proposed sampling locations at Building 9200.

Groundwater samples will be collected from 11 existing site monitoring wells (ECS-1, ECS-2, ECS-3, ECS-4, OBG-5A/5B, ECS-6, ECS-7, OBG-8/8A, and the bedrock well). These wells are located upgradient, downgradient, and adjacent to Building 9200 and are situated in the shallow and deeper portions of the surficial aquifer and in the bedrock aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and EDB by EPA 504. Table 2-12 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

2.1.12 Aqua Systems Site (SS-19) Scope of Work

A Phase II/RI report for Zone 1 was submitted in 1997 by O'Brien & Gere; however, MADEP's acceptance or rejection of the report is pending. Therefore, groundwater sampling will be conducted at Zone 1 to maintain up-to-date groundwater data. Figure 2-7 presents the proposed sampling locations at Zone 1.

Groundwater samples will be collected from six existing site monitoring wells (MW-38, OBG-8, OBG-11, OBG-41, CEA-2, and CEA-5). These wells are located upgradient,

downgradient, and adjacent to the former Aqua Systems Site and are situated in the shallow portion of the surficial aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and total and dissolved lead. Table 2-13 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

2.1.13 Former Service Station, Building 1601 (SS-20) Scope of Work

Groundwater sampling will be conducted at Building 1601 to maintain up-to-date groundwater data at the site while the Phase II/RI is pending. Figure 2-9 presents the proposed sampling locations at Building 1601.

Groundwater samples will be collected from six existing site monitoring wells (ECS-33, ECS-34, OBG-36, OBG-37, OBG-38, and OBG-39). These wells are located upgradient, downgradient, and adjacent to Building 9200 and are situated in the shallow portions of the surficial aquifer. The groundwater samples will be analyzed for TPH by the January 1998 Massachusetts VPH/EPH Method, VOCs by SW-846 Method 8260, and total and dissolved lead. Table 2-14 summarizes the proposed analytical program for groundwater samples collected from site monitoring wells.

2.2 LABORATORY ANALYSIS

Tables 2-2 through 2-14 summarize the proposed analytical program for the Environmental Sampling Program. All samples will be analyzed at a minimum for TPH-VPH/EPH, including the list of targeted polycyclic aromatic hydrocarbons (PAHs) encompassed by the EPH list. Analytical samples submitted for chemical analysis will be immediately placed in appropriate laboratory-supplied containers, labeled, maintained in coolers at 4°C, and delivered to the off-site laboratory for analysis using US Environmental Protection Agency (EPA)-approved chain-of-custody protocols. Soil and groundwater samples will be submitted to the laboratory for standard turnaround time (TAT) with normal deliverables (i.e., including detailed QC documentation), as described in detail in Appendix A and in Section 4.0 of the *Revised Final Work Plan* for the Jet Test Stand Area (Montgomery Watson, 1997).

2.3 DATA REDUCTION AND VALIDATION

The analytical laboratory will prepare the data in accordance with the reporting and deliverable requirements specified in Appendix A and Section 4.0 QAPP of the *Revised Final Work Plan* for the Jet Test Stand Area (Montgomery Watson, 1997). The deliverables will include hard copies and electronic files of the data. Montgomery Watson will validate data provided by the laboratory in accordance with procedures specified in the QAPP as necessary to indicate limitations. Qualifications concerning the use of the laboratory data for source evaluation will be documented by the data validator. The data will be reduced, tabulated, evaluated, and summarized in the Analytical Data Report.

Following completion of sample analysis, data validation, and data reporting, the data will be evaluated against risk-based standards and applicable or relevant and appropriate requirements (ARARs) or to be considered (TBC) criteria. Risk-based standards set forth in the MCP will be used to identify contaminants of potential concern at the selected IRP sites. However, all detected contaminants will be applied to the MCP risk characterization of the site, as described in Section 2.2, until eliminated based on one of the following conditions:

- The chemicals are present at low frequency of detection and low concentrations;
- The chemicals are present at levels which are consistent with background concentrations for the area and there is no evidence that their presence is related to activities at the site; or
- The chemicals are field or laboratory contaminants.

The following risk-based standards will be used to evaluate data obtained during this Environmental Monitoring Program for analytes with MCP promulgated standards (MCP, 1996a):

Site	Groundwater Criteria	Soil Criteria
LF-02	GW-1	S-1
RW-04	GW-1	NA
FT-05	GW-3	S-1
WP-06	NA	S-1
WP-07	GW-2, GW-3	NA
OT-09	GW-3	S-1
LF-12	GW-1	S-1
WP-13	GW-3	S-1

WP-15	GW-3	NA
SS-16	GW-2, GW-3	NA
SS-17	GW-1	NA
SS-19	GW-2, GW-3	NA
SS-20	GW-2	NA

The following ARARs or TBCs will be used to evaluate data obtained during this investigation for analytes without MCP promulgated risk-based standards:

- Sediment results will be compared to MADEP Method 3, Stage I Environmental Risk Characterization effects based values (effects range-low), as established by the National Oceanic and Atmospheric Administration (NOAA) (NOAA, 1990).

2.4 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-Derived Waste (IDW) generated during the Environmental Monitoring Program will be stored in DOT-approved drums until analytical results are available to assist in the disposal of the IDW as described in the FSP of the *Revised Final Work Plan* for the Jet Test Stand Area (Montgomery Watson, 1997). Montgomery Watson will provide the Westover RPM with the necessary analytical data to determine the hazardous waste status of the IDW. If the IDW is determined not to be a Resource Conservation and Recovery Act (RCRA) hazardous waste, the IDW will be transported by Montgomery Watson's subcontractor to a proper disposal facility, unless otherwise instructed by Westover. RCRA hazardous waste IDW disposal will be the responsibility of Westover ARB. If required by the Installation, the LSP will provide certification that IDW has been properly characterized and that an appropriate disposal facility has been selected.

2.5 RISK CHARACTERIZATION

A characterization of risk of harm to human health will be performed to provide the quantitative and qualitative information used to establish whether a level of No Significant Risk (NSR) exists or has been achieved at each of the selected sites and to evaluate the need for remedial actions. The MCP presents three methods for performing a characterization of risk:

- Method 1, which involves the use of promulgated standards described in 310 CMR 40.0970 through 40.0999 (MCP, 1996a);

- Method 2, which allows site specific information described in 310 CMR 40.0980 through 40.0989 (MCP, 1996a) to be utilized to supplement promulgated Method 1 Standards; and
- Method 3, which uses the application of site specific methodologies described in 310 CMR 40.0990 through 40.0999 (MCP, 1996a).

Method 1 is the simplest means of characterizing risk at a site. However, this method can only be used to characterize risk at a disposal site if:

- There is a promulgated MCP Method 1 Standard for each oil and hazardous material of concern;
- The only impacted media are groundwater and soil;
- Contaminants known to bioaccumulate are not present within two feet of ground surface; and
- There are no environmental receptors identified.

Method 2 may be used to develop standards that are not available in Method 1. These developed standards are then used in conjunction with promulgated Method 1 Standards to characterize risk. Method 3 can be used to characterize risk at all sites, but must be used alone or in conjunction with Method 1 at sites where media other than soil and groundwater (i.e. sediment, surface water and/or air) are impacted or likely to be impacted, and contaminants known to bioaccumulate are present within 2 feet of identified ground surface environmental receptors.

Only a Method 1 risk assessment will be conducted using the data collected during the Environmental Monitoring Program. If a Method 2 or Method 3 risk assessment is deemed necessary following collection of data, it will be performed under a separate task order.

2.6 REPORTS

A *Draft Analytical Data Report* will be prepared upon completion of the environmental sampling. This report will provide a detailed and illustrative discussion of all field activities conducted during the environmental sampling events, analytical results, discussion of findings, a trend analysis, and recommendations for future sampling activity, where required.

This report will present the following information:

- An analytical results summary;
- A description of field activities;
- Detailed site maps;
- Site hydrogeological characteristics;
- The nature and extent of contamination;
- A Method 1 risk characterization;
- A trend analysis; and
- Conclusions and recommendations.

Upon receipt of comments on the *Draft Analytical Data Report* from the Contracting Officer (CO), Montgomery Watson will revise the reports as requested by Westover ARB, HQ AFRC and MADEP. Upon incorporation of all comments, Montgomery Watson will publish a *Final Analytical Data Report* and will distribute the reports to Westover ARB and HQ AFRC. In addition, Montgomery Watson will provide one copy of all electronic data files, spreadsheets, drawings, and report text files that constitute the *Final Analytical Data Report* to the Points of Contact (POC) listed above.

2.7 PROJECT SCHEDULE

The proposed schedule for accomplishing the work detailed in this *Work Plan* will be provided to AFRC prior to initiation of the next phase of this project.

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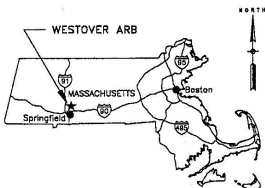
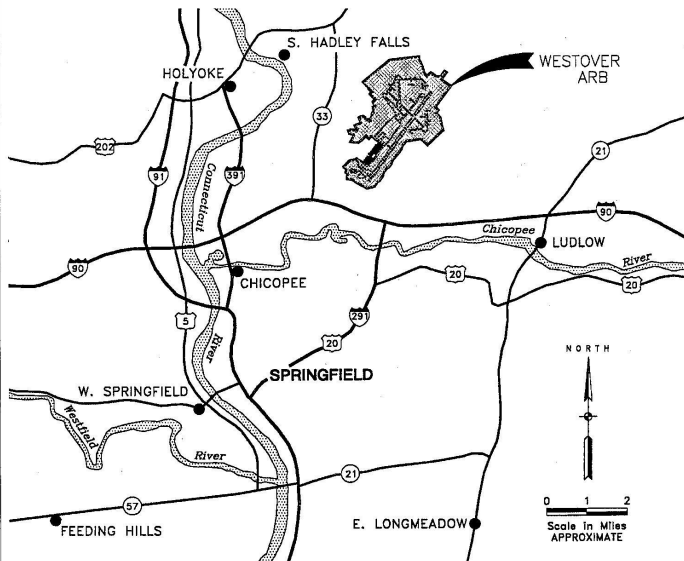
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Figures



MONTGOMERY WATSON

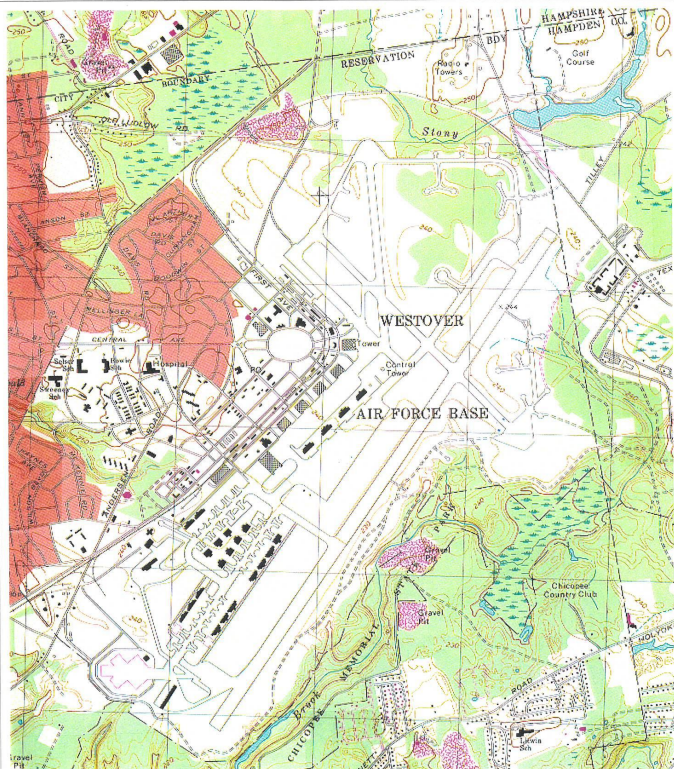


ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS
INSTALLATION LOCATION MAP



MONTGOMERY WATSON

FIGURE 1-1



Source: Springfield North, Massachusetts 7.5 minute U.S.G.S. Topographic Quadrangle Maps, dated 1972 and photorevised 1979. Contour interval 10 feet.



SCALE IN FEET



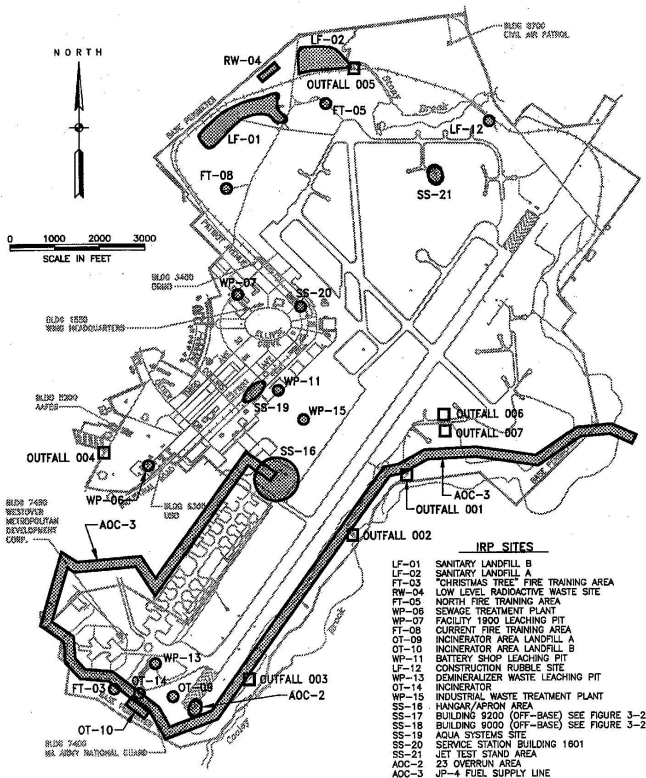
QUADRANGLE LOCATION

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS
INSTALLATION MAP



MONTGOMERY WATSON

FIGURE 1-2



ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

IRP SITES



MONTGOMERY WATSON

FIGURE 1-3

LEGEND

- PROPERTY BOUNDARY
- RAILROAD TRACK
- SURFACE WATER FEATURE
- IRP SITE DESIGNATION
- MONITORING WELL LOCATION AND NUMBER

LF-02

B-11

PROPERTY BOUNDARY

RAILROAD TRACK

SURFACE WATER FEATURE

IRP SITE DESIGNATION

MONITORING WELL LOCATION AND NUMBER

RW-04

LF-01

LF-02

AF1

NF-1

FT-05

Story Brook

NORTH

0 200 400 600
SCALE IN FEET

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

LANDFILL A (LF-02), RADIOACTIVE WASTE SITE
(RW-04), NORTH FTA (FT-05) SITE MAP



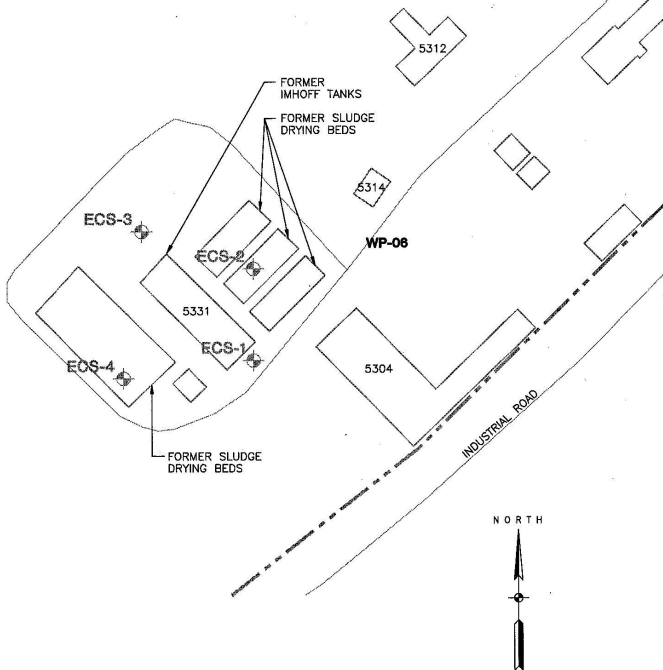
MONTGOMERY WATSON

FIGURE 1-4

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LEGEND

--- PROPERTY BOUNDARY

--- PROPERTY BOUNDARY

WP-06

IRP SITE DESIGNATION



ECS-3

GROUNDWATER MONITORING WELL
LOCATION AND NUMBER

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

SEWAGE TREATMENT PLANT
(WP-06) SITE MAP



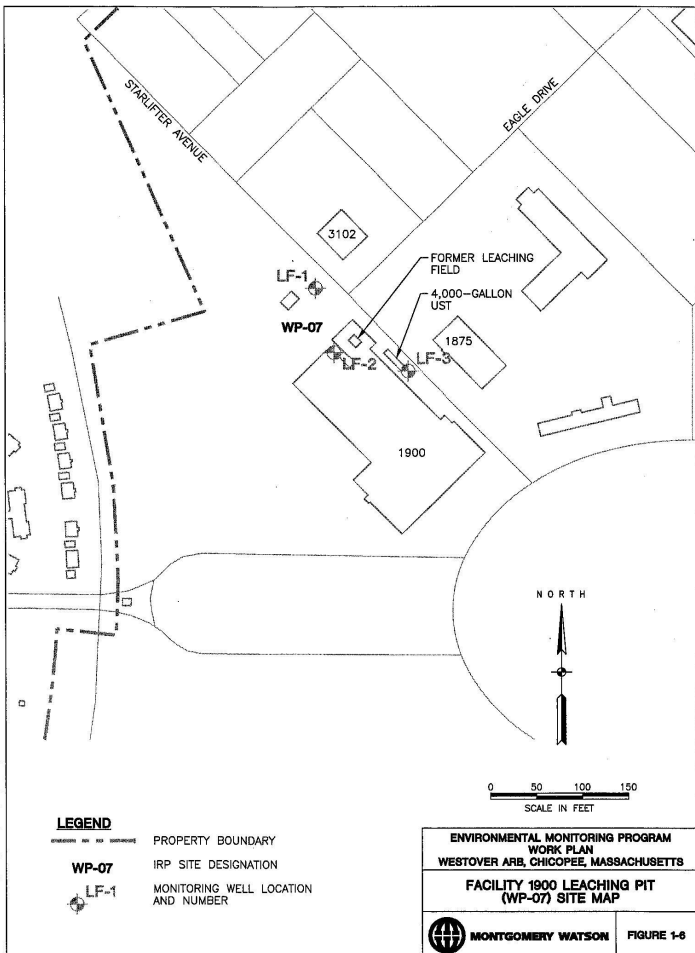
MONTGOMERY WATSON

FIGURE 1-5

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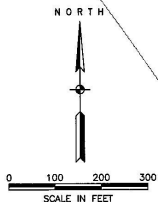
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LEGEND

OT-09



MW-2

IRP SITE DESIGNATION

MONITORING WELL LOCATION
AND NUMBER

APPROXIMATE
LIMITS OF
INCINERATOR
LANDFILL A

OT-09

MW-1

MW-2

MW-3

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

**INCINERATOR LANDFILL A
(OT-09) SITE MAP**



MONTGOMERY WATSON

FIGURE 1-7

BLDG. 8700
CIVIL AIR
PATROL

LEGEND

- PROPERTY BOUNDARY
- +++ RAILROAD TRACK
- - - SURFACE WATER FEATURE
- LF-12 IRP SITE DESIGNATION
- Construction Debris

LF-12

NORTH

0 200 400 600
SCALE IN FEET

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

CONSTRUCTION RUBBLE LANDFILL
(LF-12) SITE MAP



MONTGOMERY WATSON

FIGURE 1-8

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CREATED BY: CCM

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WP-13

PARKING LOT

STANDPIPE (TYP.)

LEACHATE DRAINAGE
PIPE (TYP.)

7400

NORTH

0 50 100 150
SCALE IN FEET

LEGEND

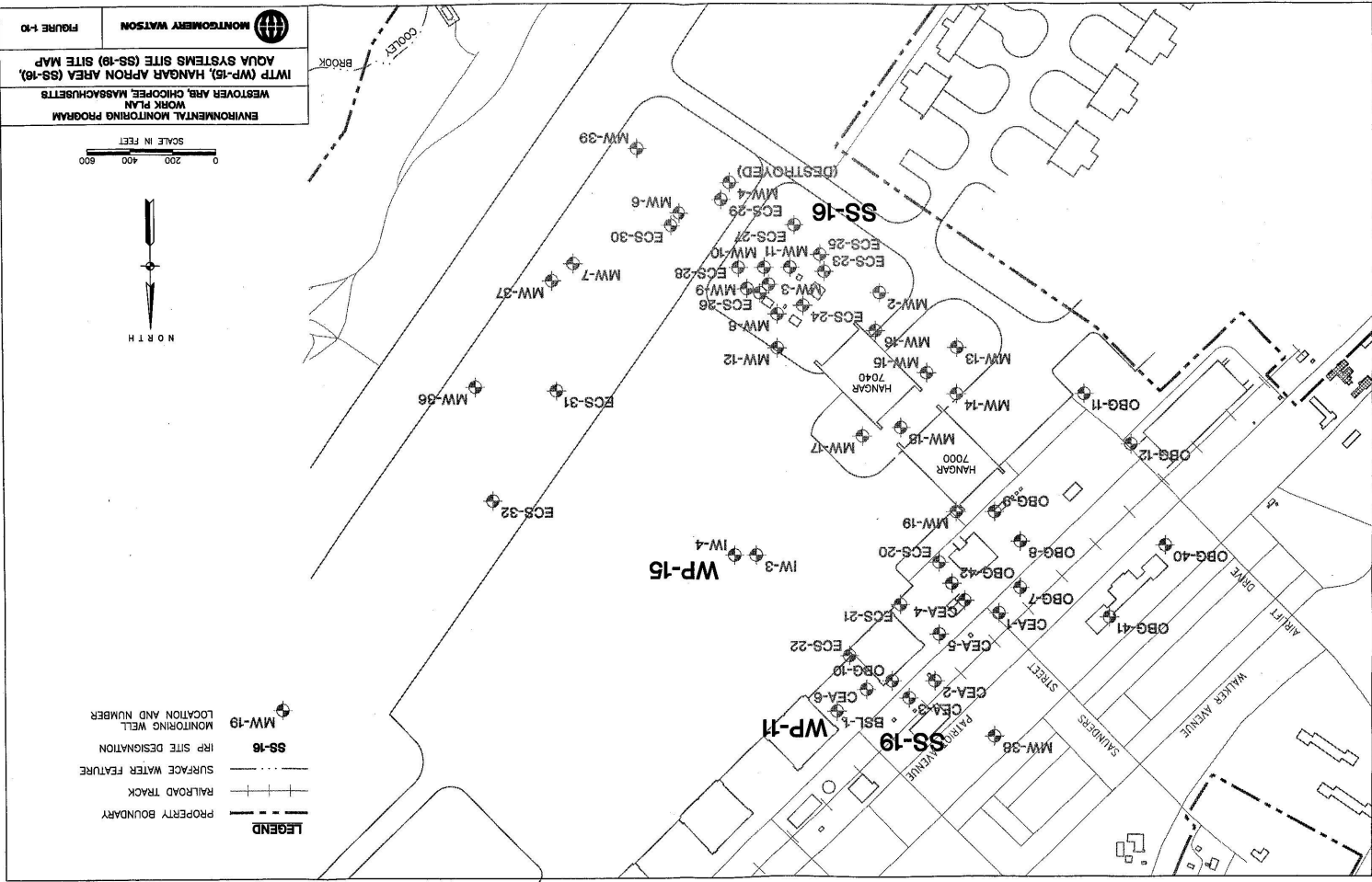
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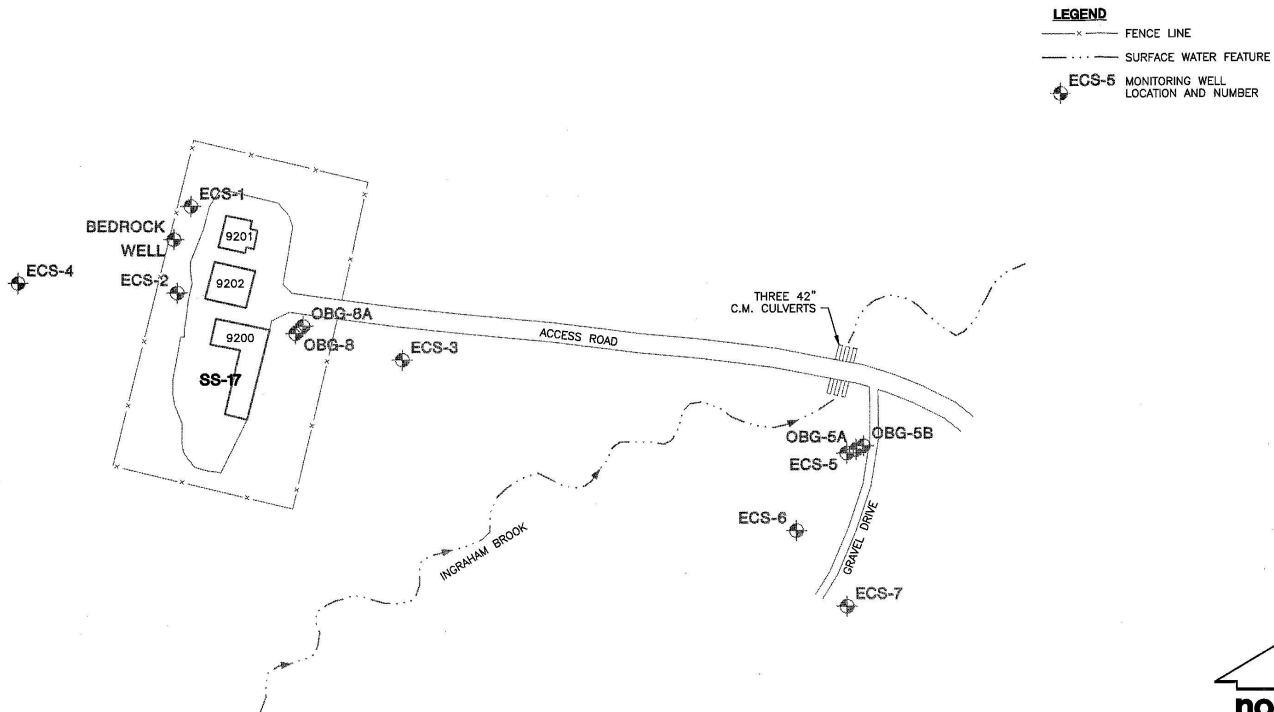
ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS
DEMINERALIZER WASTE LEACHING PIT
(WP-13) SITE MAP



MONTGOMERY WATSON

FIGURE 1-9






north
NOT TO SCALE

**ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS**

BUILDING 9200 (SS-17) SITE MAP

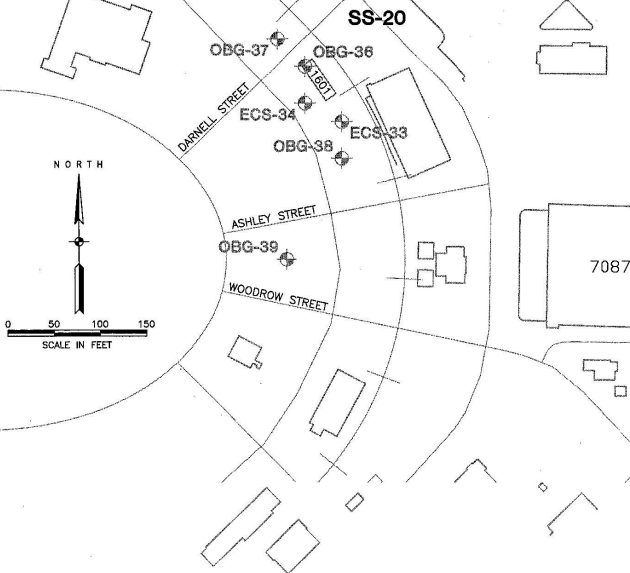


FIGURE 1-11

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LEGEND



RAILROAD TRACK

SS-20

IRP SITE DESIGNATION



OBG-37 MONITORING WELL LOCATION AND NUMBER

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

SERVICE STATION BUILDING 1601
(SS-20) SITE MAP

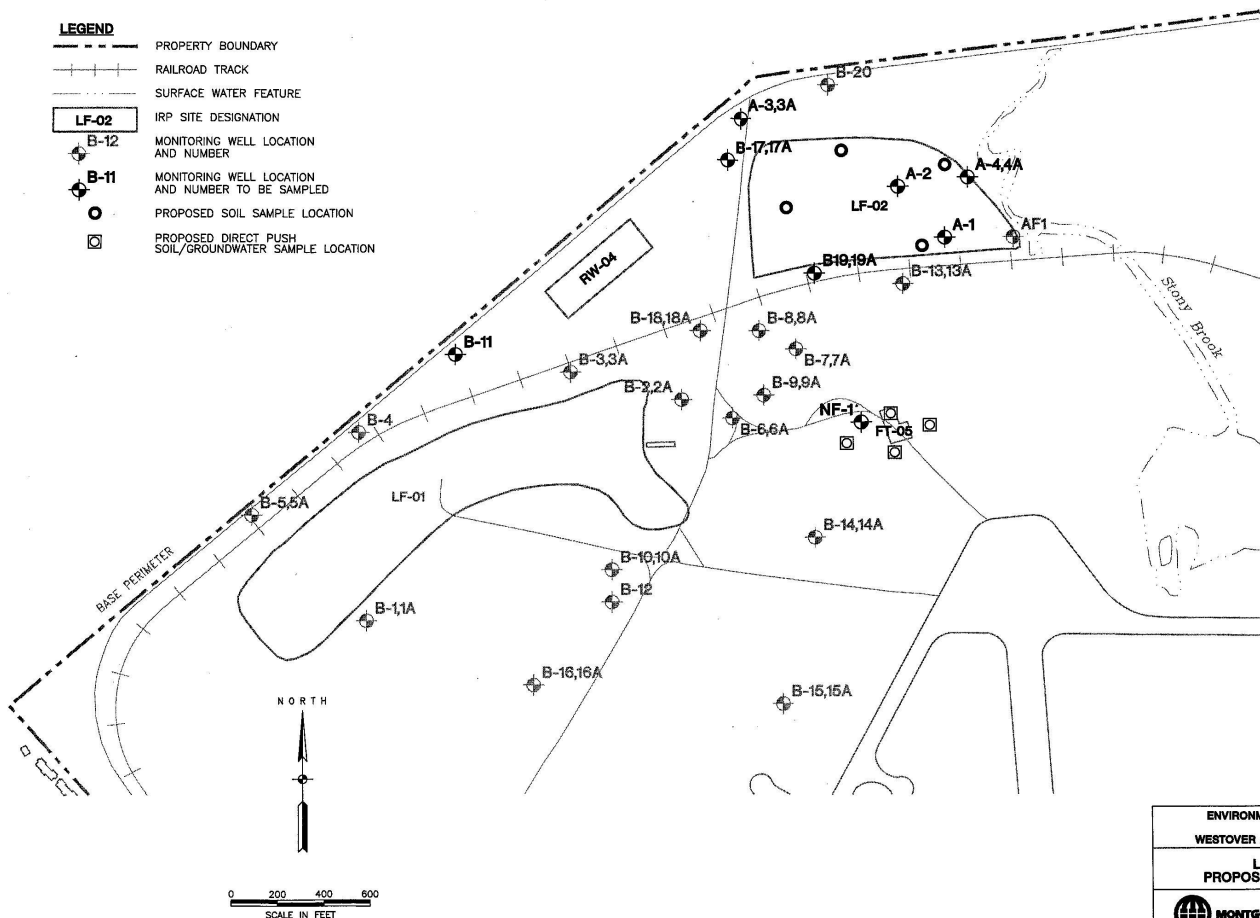


MONTGOMERY WATSON

FIGURE 1-12

LEGEND

- PROPERTY BOUNDARY
- RAILROAD TRACK
- SURFACE WATER FEATURE
- LF-02 IRP SITE DESIGNATION
- B-12 MONITORING WELL LOCATION AND NUMBER
- B-11 MONITORING WELL LOCATION AND NUMBER TO BE SAMPLED
- PROPOSED SOIL SAMPLE LOCATION
- PROPOSED DIRECT PUSH SOIL/GROUNDWATER SAMPLE LOCATION

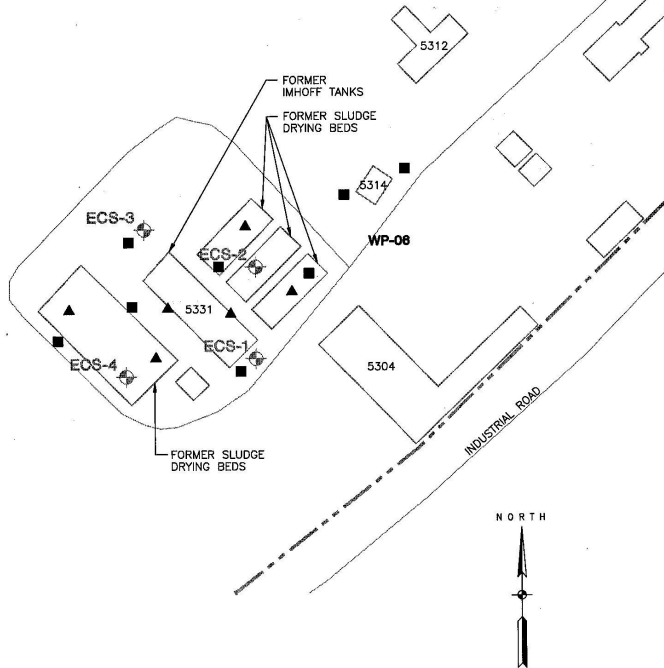


ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS
LF-02, RW-04, FT-05
PROPOSED SAMPLING LOCATIONS



MONTGOMERY WATSON

FIGURE 2-1

**LEGEND**

(CONTINUOUS AND NEW MONITORINGS)

WP-06

PROPERTY BOUNDARY

IRP SITE DESIGNATION

GROUNDWATER MONITORING WELL
LOCATION AND NUMBER

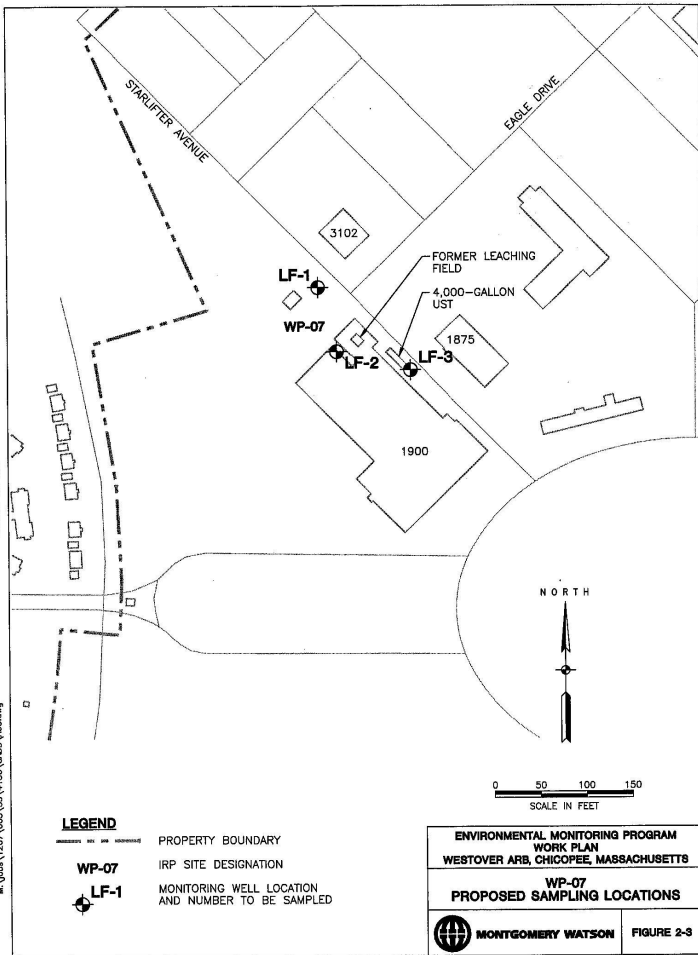
PROPOSED CYANIDE SAMPLE LOCATION

PROPOSED PESTICIDE SAMPLE LOCATION

**ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS**

**WP-06
PROPOSED SAMPLING LOCATIONS**

**MONTGOMERY WATSON****FIGURE 2-2**

**LEGEND**

--- PROPERTY BOUNDARY

PROPERTY BOUNDARY

WP-07

IRP SITE DESIGNATION

LF-1MONITORING WELL LOCATION
AND NUMBER TO BE SAMPLED

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

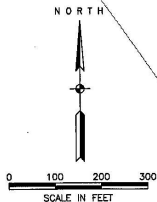
WP-07
PROPOSED SAMPLING LOCATIONS

**MONTGOMERY WATSON****FIGURE 2-3**

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LEGEND

OT-09

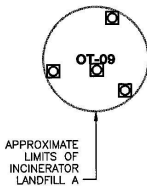
IRP SITE DESIGNATION

MW-2

MONITORING WELL LOCATION
AND NUMBER



PROPOSED DIRECT PUSH
SOIL/GROUNDWATER SAMPLE LOCATION



MW-1

MW-2

MW-3

ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

OT-09
PROPOSED SAMPLING LOCATIONS



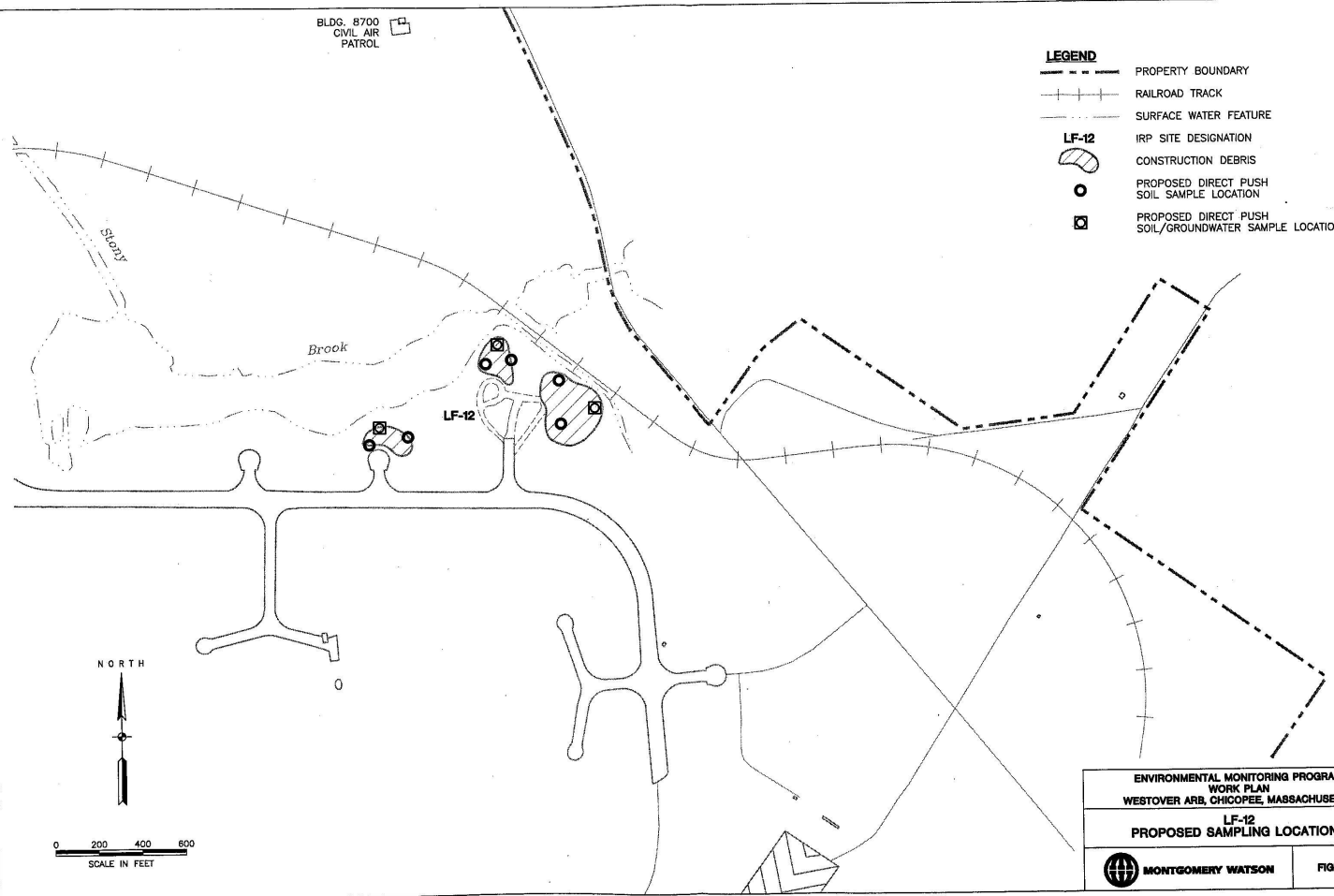
MONTGOMERY WATSON

FIGURE 2-4

BLDG. 8700
CIVIL AIR
PATROL

LEGEND

- PROPERTY BOUNDARY
- RAILROAD TRACK
- SURFACE WATER FEATURE
- LF-12 IRP SITE DESIGNATION
- CONSTRUCTION DEBRIS
- PROPOSED DIRECT PUSH SOIL SAMPLE LOCATION
- PROPOSED DIRECT PUSH SOIL/GROUNDWATER SAMPLE LOCATION



ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

LF-12
PROPOSED SAMPLING LOCATIONS



MONTGOMERY WATSON

FIGURE 2-5

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CREATED BY: CCM

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LEGEND

---X--- FENCE



PROPOSED SOIL/SLUDGE
SAMPLE LOCATION



PROPOSED SOIL/GROUNDWATER
SAMPLE LOCATION

WP-13

PARKING LOT

STANDPIPE (TYP.)

LEACHATE DRAINAGE
PIPE (TYP.)

7400

NORTH

0 50 100 150
SCALE IN FEET

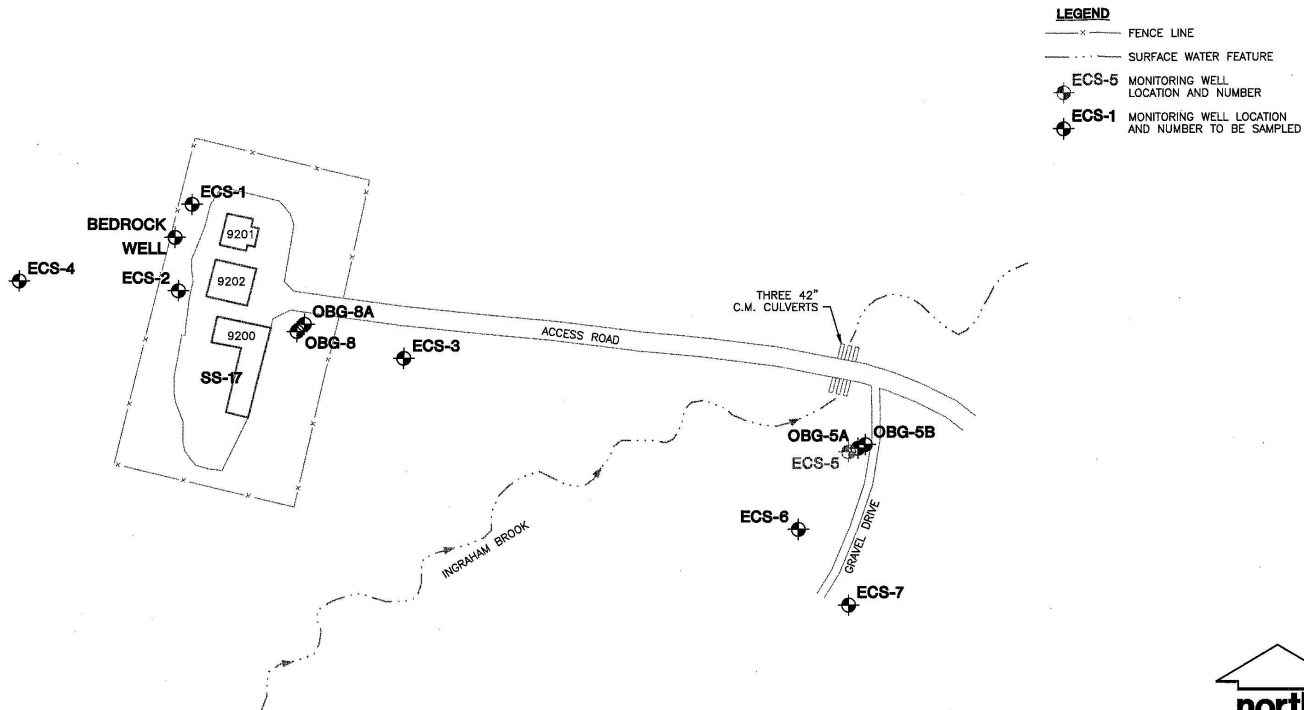
ENVIRONMENTAL MONITORING PROGRAM
WORK PLAN
WESTOVER ARB, CHICOPEE, MASSACHUSETTS

WP-13
PROPOSED SAMPLING LOCATIONS

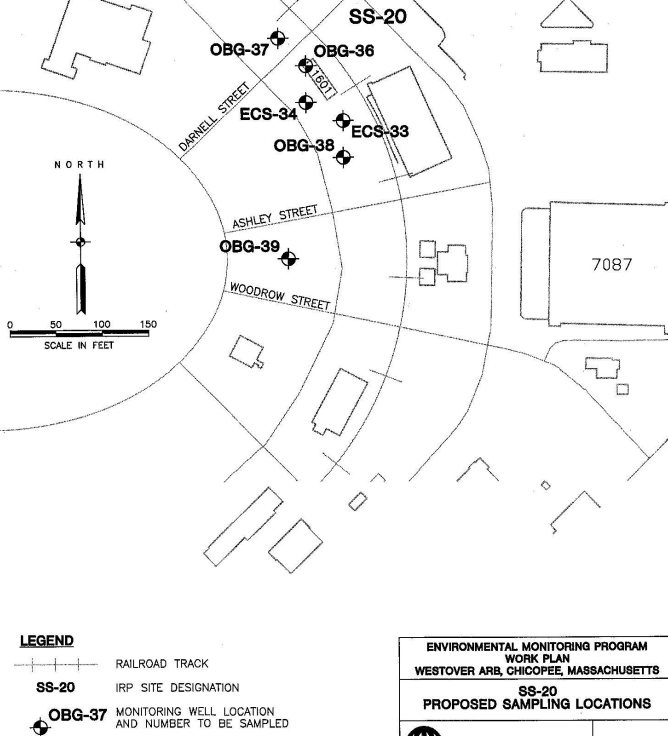


MONTGOMERY WATSON

FIGURE 2-6



ENVIRONMENTAL MONITORING PROGRAM WORK PLAN WESTOVER ARB, CHICOPEE, MASSACHUSETTS	
SS-17 PROPOSED SAMPLING LOCATIONS	
 MONTGOMERY WATSON	FIGURE 2-8



Tables



MONTGOMERY WATSON

Table 2-1

**Summary of Monitoring Wells to be Sampled by Site
Environmental Monitoring Program
Westover ARB, Chicopee, MA**

Page 1 of 1

Site	Wells To Be Sampled	
Landfill A (LF-02)	A-1	A-3/3A
	A-2	A-4/4A
Low-Level Radioactive Waste Site (RW-04)	A-3/3A	B-17/17A
	B-11	B-19/19A
North Fire Training Area (FT-05)	NF-1	
Sewage Treatment Plant (WP-06)	NA	
Facility 1900 Leaching Pit (WP-07)	LF-1	LF-3
	LF-2	
Incinerator Landfill A (OT-09)	NA	
Construction Rubble Landfill (LF-12)	NA	
Demineralizer Waste Leaching Pit (WP-13)	NA	
Industrial Waste Treatment Plant (WP-15)	IW-3	
Hangar Apron Area (SS-16)	ECS-21	MW-2
	ECS-23	MW-11
	ECS-26	MW-13
	ECS-27	MW-19
	ECS-29	MW-36
	ECS-30	MW-37
	ECS-31	
Building 9200 (SS-17)	ECS-1	ECS-6
	ECS-2	ECS-7
	ECS-3	OBG-8/8A
	ECS-4	bedrock well
	OBG-5A/5B	
Aqua Systems Site (SS-19)	CEA-2	OBG-11
	CEA-5	OBG-41
	OBG-8	MW-38
Service Station Building 1601 (SS-20)	ECS-33	OBG-37
	ECS-34	OBG-38
	OBG-36	OBG-39

Table 2-2

**Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Landfill A (LF-02)
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	EDB	PCBs	Metals, total	Metals, dissolved	Pesticides
Soil Samples-Standard TAT								
Soil Samples from Direct-Push	Soil	4	4	0	4	4	0	4
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Soil	1	1	0	1	1	0	1
Equipment Blank	Aqueous	1	1	0	1	1	0	1
MS/MSD	Soil	1	1	0	1	1	0	1
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	6	6	6	0	6	6	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	1	0	1	1	0
Equipment Blanks	Aqueous	1	1	1	0	1	1	0
MS/MSD	Aqueous	1	1	1	0	1	1	0

VOCs	Volatile Organic Compounds
TAT	Laboratory Turnaround Time
TPH-VPH/EPH	Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons
MS/MSD	Matrix Spike/Matrix Spike Duplicate Analysis
PCBs	Polychlorinate biphenyls
EDB	Ethylene Dibromide

Table 2-3

**Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Low-Level Radioactive Waste Site (RW-04)
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Samples		Matrix	Gross Alpha	Gross Beta	Gross Gamma
Monitoring Well Groundwater Samples - Standard TAT					
	Groundwater Samples	Aqueous	7	7	7
	Trip Blanks	Aqueous	0	0	0
	Field Duplicates	Aqueous	1	1	1
	Equipment Blanks	Aqueous	1	1	1
	MS/MSD	Aqueous	0	0	0
TAT	Laboratory Turnaround Time				
MS/MSD	Matrix Spike/Matrix Spike Duplicate Analysis				

Table 2-4

**Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
North Fire Training Area (FT-05)
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Metals, total	Metals, dissolved	Pesticides
Soil Samples-Standard TAT								
Soil Samples from Direct-Push	Soil	8	8	0	8	8	0	8
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Soil	1	1	0	1	1	0	1
Equipment Blank	Aqueous	1	1	0	1	1	0	1
MS/MSD	Soil	1	1	0	1	1	0	1
Direct-Push Groundwater Samples -Standard TAT								
Shallow Groundwater Samples	Aqueous	4	4	0	0	4	4	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blank	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	1	1	0	0	1	1	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blanks	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs Volatile Organic Compounds

TAT Laboratory Turnaround Time

TPH-VPH/EPH Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD Matrix Spike/Matrix Spike Duplicate Analysis

PCBs Polychlorinate biphenyls

Table 2-5
Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Sewage Treatment Plant (WP-06)
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples		Matrix	Cyanide	Pesticides
Soil Samples-Standard TAT				
	Soil Samples from Direct-Push	Soil	6	8
	Trip Blanks	Aqueous	0	0
	Field Duplicates	Soil	1	1
	Equipment Blank	Aqueous	1	1
	MS/MSD	Soil	1	1
TAT	Laboratory Turnaround Time			
MS/MSD	Matrix Spike/Matrix Spike Duplicate Analysis			

Table 2-6

**Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Facility 1900 Leaching Pit (WP-07)
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Metals, total	Metals, dissolved	Pesticides
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	3	3	0	0	3	3	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blanks	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs Volatile Organic Compounds

TAT Laboratory Turnaround Time

TPH-VPH/EPH Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD Matrix Spike/Matrix Spike Duplicate Analysis

PCBs Polychlorinated biphenyls

Table2-7

**Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Incinerator Landfill A (OT-09)
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Metals, total	Metals, dissolved	Pesticides
Soil Samples-Standard TAT								
Soil Samples from Direct-Push	Soil	8	8	0	8	8	0	8
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Soil	1	1	0	1	1	0	1
Equipment Blank	Aqueous	1	1	0	1	1	0	1
MS/MSD	Soil	1	1	0	1	1	0	1
Direct-Push Groundwater Samples -Standard TAT								
Shallow Groundwater Samples	Aqueous	4	4	0	0	4	4	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blank	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs Volatile Organic Compounds

TAT Laboratory Turnaround Time

TPH-VPH/EPH Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD Matrix Spike/Matrix Spike Duplicate Analysis

PCBs Polychlorinated biphenyls

Table 2-8

Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Construction Rubble Landfill (LF-12)
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	EDB	SVOCs	PCBs	Metals, total	Metals, dissolved	Pesticides
Soil Samples-Standard TAT									
Soil Samples from Direct-Push	Soil	9	9	0	9	9	9	0	9
Trip Blanks	Aqueous	1	1	0	0	0	0	0	0
Field Duplicates	Soil	1	1	0	1	1	1	0	1
Equipment Blank	Aqueous	1	1	0	1	1	1	0	1
MS/MSD	Soil	1	1	0	1	1	1	0	1
Direct-Push Groundwater Samples -Standard TAT									
Shallow Groundwater Samples	Aqueous	3	3	3	0	0	3	3	0
Trip Blanks	Aqueous	1	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	1	0	0	1	1	0
Equipment Blank	Aqueous	1	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	1	0	0	1	1	0

VOCs Volatile Organic Compounds

TAT Laboratory Turnaround Time

TPH-VPH/EPH Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD Matrix Spike/Matrix Spike Duplicate Analysis

PCBs Polychlorinated biphenyls

EDB Ethylene Dibromide

Table 2-9

**Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Demineralizer Waste Leaching Pit (WP-13)
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Metals, total	Metals, dissolved	Pesticides
Soil Samples-Standard TAT								
Soil Samples from Direct-Push	Soil	2	2	0	0	2	0	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Soil	1	1	0	0	1	0	0
Equipment Blank	Aqueous	1	1	0	0	1	0	0
MS/MSD	Soil	1	1	0	0	1	0	0
Direct-Push Groundwater Samples -Standard TAT								
Shallow Groundwater Samples	Aqueous	1	1	0	0	1	1	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blank	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0
Sludge Samples-Standard TAT								
Groundwater Samples	Aqueous	1	1	0	0	1	1	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blank	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs Volatile Organic Compounds

TAT Laboratory Turnaround Time

TPH-VPH/EPH Total Petroleum Hydrocarbons/Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD Matrix Spike/Matrix Spike Duplicate Analysis

PCBs Polychlorinated biphenyls

Table 2-10

Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Industrial Waste Treatment Plant (WP-15)
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Lead, total	Lead, dissolved	Pesticides
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	1	1	0	0	1	1	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blanks	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs Volatile Organic Compounds

TAT Laboratory Turnaround Time

TPH-VPH/EPH Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD Matrix Spike/Matrix Spike Duplicate Analysis

PCBs Polychlorinated biphenyls

Table 2-11

Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Hangar Apron Area (SS-16)
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Lead, total	Lead, dissolved	Pesticides
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	13	13	0	0	13	13	0
Trip Blanks	Aqueous	2	2	0	0	0	0	0
Field Duplicates	Aqueous	2	2	0	0	2	2	0
Equipment Blanks	Aqueous	2	2	0	0	2	2	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs	Volatile Organic Compounds
TAT	Laboratory Turnaround Time
TPH-VPH/EPH	Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons
MS/MSD	Matrix Spike/Matrix Spike Duplicate Analysis
PCBs	Polychlorinated biphenyls

Table 2-12

Summary of Chemical Analyses
Environmental Sampling, Environmental Monitoring Program
Building 9200 (SS-17)
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples		Matrix	VOCs	TPH- VPH/EPH	EDB	PCBs	Metals, total	Metals, dissolved	Pesticides
Monitoring Well Groundwater Samples - Standard TAT									
	Groundwater Samples	Aqueous	11	11	11	0	0	0	0
	Trip Blanks	Aqueous	2	2	2	0	0	0	0
	Field Duplicates	Aqueous	2	2	2	0	0	0	0
	Equipment Blanks	Aqueous	2	2	2	0	0	0	0
	MS/MSD	Aqueous	1	1	1	0	0	0	0
VOCs	Volatile Organic Compounds								
TAT	Laboratory Turnaround Time								
TPH-VPH/EPH	Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons								
MS/MSD	Matrix Spike/Matrix Spike Duplicate Analysis								
PCBs	Polychlorinate biphenyls								

Table 2-13

Summary of Chemical Analyses
 Environmental Sampling, Environmental Monitoring Program
 Aqua Systems Site (SS-19)
 Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Lead, total	Lead, dissolved	Pesticides
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	6	6	0	0	6	6	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blanks	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs

Volatile Organic Compounds

TAT

Laboratory Turnaround Time

TPH-VPH/EPH

Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons

MS/MSD

Matrix Spike/Matrix Spike Duplicate Analysis

PCBs

Polychlorinate biphenyls

Table 2-14

Summary of Chemical Analyses
 Environmental Sampling, Environmental Monitoring Program
 Service Station Building 1601 (SS-20)
 Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Samples	Matrix	VOCs	TPH- VPH/EPH	SVOCs	PCBs	Lead, total	Lead, dissolved	Pesticides
Monitoring Well Groundwater Samples - Standard TAT								
Groundwater Samples	Aqueous	6	6	0	0	6	6	0
Trip Blanks	Aqueous	1	1	0	0	0	0	0
Field Duplicates	Aqueous	1	1	0	0	1	1	0
Equipment Blanks	Aqueous	1	1	0	0	1	1	0
MS/MSD	Aqueous	1	1	0	0	1	1	0

VOCs	Volatile Organic Compounds
TAT	Laboratory Turnaround Time
TPH-VPH/EPH	Total Petroleum Hydrocarbons-Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons
MS/MSD	Matrix Spike/Matrix Spike Duplicate Analysis
PCBs	Polychlorinated biphenyls

Appendices



MONTGOMERY WATSON

Appendix A



MONTGOMERY WATSON

APPENDIX A
ADDENDUM TO QAPP

QUALITY ASSURANCE PROJECT PLAN

This document is an Addendum to the QAPP included in Section 4.0 of the *Revised Final Work Plan* for the Phase II/RI conducted at the Jet Test Stand Area (Montgomery Watson, 1997). This section of the *Work Plan* describes the generic QA/QC procedures to be followed for field and laboratory activities conducted during the implementation of the scope of work described in Section 2. This Addendum updates the QAPP by including the analytical parameters necessary to complete the Environmental Monitoring Program at Westover ARB and includes any modifications to other sections of the QAPP.

4.1 PROJECT ORGANIZATION AND RESPONSIBILITIES

The project team consists of Montgomery Watson personnel and subcontractors. Figure 4-1 is an updated organization chart that presents the key individual assignments that have been selected for this project.

4.2 DATA QUALITY OBJECTIVES

The data quality objectives of the Environmental Monitoring Program is as follows:

4.2.1 Data Quality Objectives for Shallow Groundwater Samples Collected Using Direct-Push

Shallow groundwater data obtained using direct-push sampling equipment will be used to assess the extent of groundwater contamination at the individual sites and will be compared to risk-based standards, ARARs, or TBCs for each site. Therefore, groundwater samples collected using direct-push will be definitive type data.

4.2.2 Data Quality Objectives for Soil Samples

Soil data obtained from the site will be used to compare to risk-based standards and ARARs, for each site. Therefore, soil data will be definitive-type data.

4.2.3 Data Quality Objectives for Groundwater Samples Collected From Monitoring Wells

Groundwater data obtained from monitoring wells at the individual sites will be used to compare risk-based standards, ARARs, or TBCs. Therefore, groundwater data obtained from existing monitoring wells and points at each site will be definitive-type data.

4.2.4 Data Quality Objectives for Surface Water/Sediment Samples

Surface water and sediment data will be used to compare to risk-based standards, ARARs, or TBCs. Therefore, surface water and sediment data obtained at the site will be definitive-type data.

4.3 SAMPLING PROCEDURES

Sample containers, preservation methods, and extraction/analytical holding times appropriate to this Environmental Monitoring Program are presented in Table 4-1.

4.4 LABORATORY ANALYTICAL METHODS AND PROCEDURES

4.4.1 Analytical Methods and Procedures

Analytical procedures performed under this contract will conform to the most recently promulgated version of SW-846. Specifically, this QAPP will address the following analyses that will be relevant for work on this contract: SW-846 Method 8260 for VOCs; SW-846 Method 8270 for SVOCs; SW-846 Methods 6010/7470/7841 for metals; SW-846 Methods 8081/8082 for PCBs and pesticides; and the MADEP January 1998 Method for determination of TPH-VPH/EPH. Table 4-2 summarizes the analytical methods to be used for this project. The revised tables summarizing the proposed Practical Quantitation Limits (PQLs) and the calibration procedures, acceptance criteria, and corrective action procedures for the analytical parameters to be used during the Environmental Monitoring Program are included in this Addendum.

4.5 DATA REDUCTION, VALIDATION AND REPORTING

The laboratory control limits for matrix spike/matrix spike duplicate (MS/MSD) samples, laboratory control samples (LCS), method/instrument blanks, and laboratory duplicates are provided in this Addendum.

4.6 ANALYTICAL QUALITY CONTROL REQUIREMENTS

The analytical quality control requirements do not require revisions.

4.7 CORRECTIVE ACTION

The revised tables summarizing the corrective actions for each quality control element (e.g. method blank, MS, MSD, etc.) are provided in this Addendum.

4.8 PREVENTIVE MAINTENANCE PROGRAM

The preventative maintenance program does not require revisions.

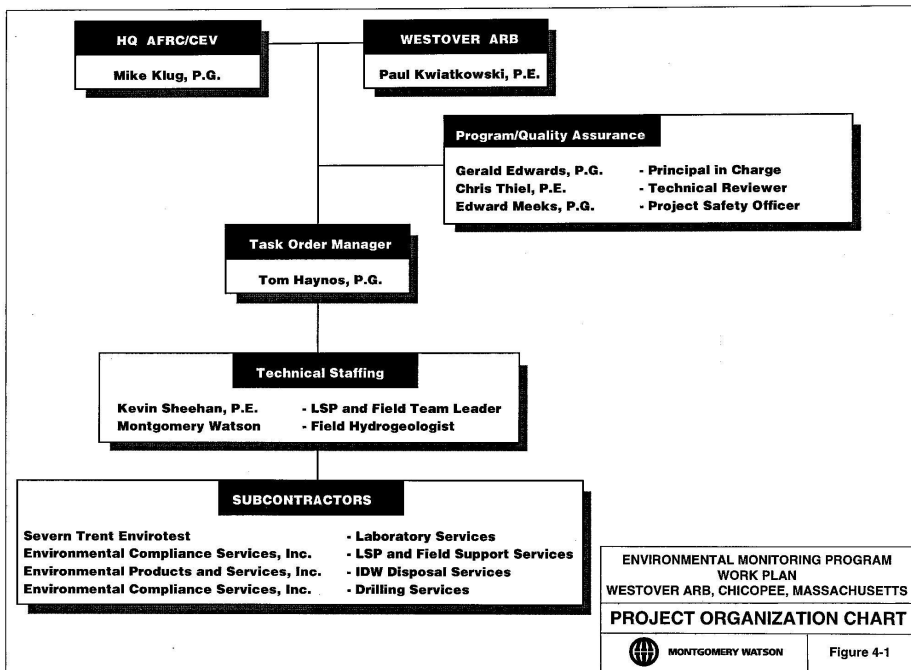


Table 4-1
Sample Containers, Preservation Methods, and Analytical Holding Times
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 1

Parameter	Matrix	Container	Lid	Preservation	Maximum Holding Times	
					Extraction ^(a)	Analysis ^(b)
VOCs	Aqueous Soil	40 ml glass vials 4 oz glass jar	Caps with Teflon septum Teflon-lined lids	HCl to pH<2; Ice to 4°C Ice to 4°C	-- --	14 days 14 days
SVOCs	Aqueous Soil	(2) 1 liter amber glass b 250 ml w/m glass jars	Caps with Teflon liner Caps with Teflon liner	Ice to 4°C Ice to 4°C	7 days 14 days	40 days 40 days
Metals	Aqueous Soil	1 liter polyethylene 16 oz glass jar	Cap with Teflon seal Teflon-lined lids	HNO ₃ to pH<2; Ice to 4°C Ice to 4°C	-- --	6 months (Hg: 28 days) 6 months (Hg: 28 days)
TPH-EPH	Aqueous Soil	1 liter glass amber jar 4 oz glass jar	Teflon-lined caps Teflon-lined lids	5 ml HCl; Ice to 4°C Ice to 4°C	7 days 7 days	40 days 40 days
TPH-VPH	Aqueous Soil	40 ml glass vials 40 ml glass vials	Caps with Teflon septum Teflon-lined lids	HCl to pH<2; Ice to 4°C 25 ml methanol to 25 g soil; Ice to 4°C	-- --	14 days 28 days
PCBs	Soil	16 oz glass jar	Teflon-lined lids	Ice to 4°C	14 days	40 days
Pesticides	Soil	16 oz glass jar	Teflon-lined lids	Ice to 4°C	14 days	40 days

EPH Extractable Petroleum Hydrocarbons

PCB Polychlorinated Biphenyls

TPH Total Petroleum Hydrocarbons

VOCs Volatile Organic Compounds

VPH Volatile Petroleum Hydrocarbons

g gram

ml milliliter

oz ounce

(a) Starting from the date of collection.

(b) Starting from the date of extraction; if no extraction is involved, starting from the date of collection.

Table 4-2

**Summary of Analytical Methods
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 2

Parameter	Matrix	Analysis		Extraction / Preparation	
		Method	Procedure	Method	Procedure
Aqueous Methods					
Volatile Organic Compounds	Aqueous	SW-846 8260	GC/MS	SW-846 5030	Purge and Trap
Total Petroleum Hydrocarbons - VPH	Aqueous	MADEP	GC/MS	SW-846 5030	Purge and Trap with Methanol Extraction
Total Petroleum Hydrocarbons - EPH	Aqueous	MADEP	GC/MS/FID	SW-846 3510	Separatory Funnel Liquid/Liquid
Antimony	Aqueous	SW-846 7041	GFAA	SW-846 3020	Acid Digestion
Arsenic	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Beryllium	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Cadmium	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Chromium	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Copper	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Lead	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Mercury	Aqueous	SW-846 7470	CVAA	NA	NA
Nickel	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Selenium	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Silver	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Thallium	Aqueous	SW-846 7841	GFAA	SW-846 3020	Acid Digestion
Zinc	Aqueous	SW-846 6010	ICP	SW-846 3005	Acid Digestion
Hardness as CaCO3	Aqueous	EPA 130.2	Titrimetric	NA	NA
Soil/Sediment Methods					
Volatile Organic Compounds	Soil/Sediment	SW-846 8260	GC/MS	SW-846 5030	Purge and Trap
Total Petroleum Hydrocarbons - VPH	Soil/Sediment	MADEP	GC/MS	SW-846 5030	Purge and Trap
Total Petroleum Hydrocarbons - EPH	Soil/Sediment	MADEP	GC/MS/FID	SW-846 3550	Ultrasonic
Polychlorinated Biphenyls	Soil/Sediment	SW-846 8082	GC/ECD	SW-846 3540	Soxhlet
Pesticides	Soil/Sediment	SW-846 8081	GC/ECD	SW-846 3540	Soxhlet
Lead	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion

Table 4-2

**Summary of Analytical Methods
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts**

Page 2 of 2

Parameter	Matrix	Analysis		Extraction / Preparation	
		Method	Procedure	Method	Procedure
Soil/Sediment Methods (cont'd)					
Mercury	Soil/Sediment	SW-846 7471	CVAA	NA	NA
Nickel	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Selenium	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Silver	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Thallium	Soil/Sediment	SW-846 7841	GFAA	SW-846 3050	Acid Digestion
Zinc	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Antimony	Soil/Sediment	SW-846 7041	GFAA	SW-846 3050	Acid Digestion
Arsenic	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Beryllium	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Cadmium	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Chromium	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion
Copper	Soil/Sediment	SW-846 6010	ICP	SW-846 3050	Acid Digestion

CVAA Cold Vapor Atomic Absorption

ECD Electron Capture Detector

FID Flame Ionization Detector

GC Gas Chromatograph

GFAA Graphite Furnace Atomic Absorption

GFAA Graphite Furnace Atomic Absorption

ICP Inductively Coupled Plasma

Mod Modified

MS Mass Spectrometer

SIM Single Ion Monitoring

NA Not Applicable

Note: All extraction, preparation, and analytical procedures shall conform to the most recently promulgated version of SW-846.

Practical Quantitation Limits for Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 2

Parameter	Method	Analyte	Water (µg/l)	Soil (mg/kg)
Volatile Organic Compounds	SW8260	Benzene	1.0	0.005
		Bromobenzene	1.0	0.005
		Bromochloromethane	1.0	0.005
		Bromodichloromethane	1.0	0.005
		Bromoform	1.0	0.005
		Bromomethane	1.0	0.005
		n-Butylbenzene	2.0	0.005
		sec-Butylbenzene	2.0	0.005
		Carbon tetrachloride	1.0	0.005
		Chlorobenzene	1.0	0.005
		Chloroethane	1.0	0.005
		Chloroform	1.0	0.005
		Chloromethane	1.0	0.005
		2-Chlorotoluene	2.0	0.005
		4-Chlorotoluene	2.0	0.005
		Dibromochloromethane	1.0	0.005
		1,2-Dibromo-3-chloropropane	2.0	0.005
		1,2-Dibromoethane	1.0	0.005
		Dibromomethane	1.0	0.005
		1,2-Dichlorobenzene	2.0	0.005
		1,3-Dichlorobenzene	2.0	0.005
		1,4-Dichlorobenzene	2.0	0.005
		Dichlorodifluoromethane	1.0	0.005
		1,1-Dichloroethane	1.0	0.005
		1,2-Dichloroethane	1.0	0.005
		1,1-Dichloroethene	1.0	0.005
		cis-1,2-Dichloroethene	1.0	0.005
		trans-1,2-Dichloroethene	1.0	0.005
		1,2-Dichloropropane	1.0	0.005
		1,3-Dichloropropane	1.0	0.005
		2,2-Dichloropropane	1.0	0.005
		1,1-Dichloropropene	1.0	0.005
		Ethylbenzene	1.0	0.005
		Hexachlorobutadiene	0.6	0.005
		Isopropylbenzene	2.0	0.005
		p-Isopropyl toluene	2.0	0.005

Practical Quantitation Limits for Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts

Page 2 of 2

Parameter	Method	Analyte	Water (µg/l)	Soil (µg/kg)
Volatile Organic Compounds (continued)	SW8260	Methylene chloride	5.0	0.005
		Naphthalene	2.0	0.005
		n-Propylbenzene	1.0	0.005
		Styrene	1.0	0.005
		tert-Butylbenzene	2.0	0.005
		1,1,1,2-Tetrachloroethane	1.0	0.005
		1,1,2,2-Tetrachloroethane	1.0	0.005
		Tetrachloroethene	1.0	0.005
		Toluene	1.0	0.005
		1,2,3-Trichlorobenzene	2.0	0.005
		1,2,4-Trichlorobenzene	2.0	0.005
		1,1,1-Trichloroethane	1.0	0.005
		1,1,2-Trichloroethane	1.0	0.005
		Trichloroethene	1.0	0.005
		Trichlorofluoromethane	1.0	0.005
		1,2,3-Trichloropropane	1.0	0.005
		1,2,4-Trimethylbenzene	2.0	0.005
		1,3,5-Trimethylbenzene	2.0	0.005
		Vinyl chloride	1.0	0.01
		m,p-Xylenes	2.0	0.005
		o-Xylene	1.0	0.005
		Acetone	10.0	0.02
		Idomethane	10.0	0.02
		Carbon Disulfide	5.0	0.005
		2-Butanone	10.0	0.02
		4-Methyl-2-pentanone	10.0	0.02
		Methyl-tert-Butyl ether	1.0	0.005
		Ethylmethacrylate	5.0	0.02
		2-Hexanone	10.0	0.02
		Trans-1,4-Dici 2-But	10.0	0.025
		cis-1,3-Dichloropropene	0.5	0.005
		trans-1,3-Dichloropropene	0.5	0.005
		Vinyl Acetate	10.0	0.005

**Practical Quantitation Limits / Method Detection Limits
For Total Petroleum Hydrocarbons
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base Chicopee, Massachusetts**

Page 1 of 1

Parameter	Method	Analyte	Aqueous (µg/l)		Soil (mg/kg)	
			PQL	MDL ¹	PQL	MDL ¹
Volatile Petroleum Hydrocarbons	MADEP VPH	C5 - C8 aliphatic	2	NA	0.3	NA
		C9 - C10 aromatic	2	NA	0.3	NA
		C9 - C12 aliphatic	2	NA	0.3	NA
		Benzene	2	1.035	0.005	0.000318
		Ethylbenzene	2	1.933	0.005	0.000303
		Toluene	2	1.076	0.005	0.000555
		Xylenes	2	1.476	0.005	0.001036
		MTBE	2	0.169	0.005	0.000156
Extractable Petroleum Hydrocarbons	MADEP EPH	C9 - C18 aliphatic	2	0.867	2	0.95
		C19 - C36 aliphatic	2	1.032	2	1.00
		C10 - C22 aromatic	2	0.867	2	1.00
		Naphthalene	2	1.133	2	.083
		2-Methylnaphthalene	3	3.049	2	0.46
		Acenaphthylene	3	2.452	2	0.85
		Acenaphthene	2	1.464	2	1.05
		Fluorene	2	1.711	2	0.98
		Phenanthrene	2	0.916	2	0.90
		Anthracene	2	1.098	2	0.91
		Fluoranthene	2	0.258	2	1.25
		Pyrene	2	0.468	2	1.16
		benzo(a)Anthracene	2	0.121	2	1.47
		Chrysene	2	0.166	2	1.39
		benzo(b)Fluoranthene	2	0.130	5	1.54
		benzo(k)Fluoranthene	2	0.144	5	1.46
		benzo(a)pyrene	2	0.205	5	1.40
		indeno(1,2,3-cd)Pyrene	2	0.129	5	1.61
		dibenzo(a,h)anthracene	2	0.296	2	1.97
		benzo(g,h,i)Perylene	2	0.179	2	1.71

¹ The VPH/EPH Methods can detect the analytes down to the MDL, but any concentration between the MDL and the PQL will be qualified with a "J".

Practical Quantitation Limits for Semi-Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 2

Parameter	Method	Analyte	Water (µg/l)	Soil (mg/kg)
Semivolatile Organic Compounds	SW8270	Acenaphthene	20	0.66
		Acenaphthylene	20	0.66
		Anthracene	20	0.66
		Benzo (a) anthracene	10	0.33
		Benzo (a) pyrene	10	0.33
		Benzo (b) flouranthene	10	0.33
		Benzo (g,h,i) perylene	20	0.66
		Benzo (k) flouranthe	10	0.33
		Benzoic acid	20	0.66
		Benzyl alcohol	20	0.66
		Bis(2-chloroethoxy) methane	20	0.66
		Bis(2-chlorethyl)ether	20	0.66
		Bis(2-chloroisopropyl)ether	20	0.66
		Bis(2-ethylhexyl)phthalate	10	0.33
		4-Bromophenyl phenyl ether	20	0.66
		Butyl benzyl phthalate	10	0.33
		4-Bromophenyl phenyl ether	20	0.66
		Butyl benzyl phthalate	20	0.66
		4-Chloro-3-Methylphenol	20	0.66
		4-Chloroaniline	20	0.66
		2-Chloronaphthalene	20	0.66
		2-Chlorophenyl	20	0.66
		4-Chlorophenyl phenyl ether	20	0.66
		Chrysene	10	0.33
		Di-n-butylphthalate	10	0.33
		Di-n-octylphthalate	10	0.33
		Dibenzo (a,h) anthracene	10	0.33
		Dibenzofuran	20	0.66
		1,2-Dichlorobenzene	20	0.66
		1,3-Dichlorobenzene	20	0.66
		1,4-Dichlorobenzene	20	0.66
		3,3-Dichlorobenzidine	20	0.67
		2,4-Dichlorophenol	20	0.66
		Diethyl phthalate	10	0.33
		Dimethyl phthalate	20	0.66
		2,4-Dimethylphenol	60	0.66
		4,6-Dinitro-2-Methylphenol	20	0.66
		2,4-Dinitrophenol	20	0.66

Practical Quantitation Limits for Semi-Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts

Page 1 of 2

Parameter	Method	Analyte	Water (µg/l)	Soil (mg/kg)
Semivolatile Organic Compounds (continued)	SW8270	2,4-Dinitrotoluene	20	0.66
		2,6-Dinitrotoluene	20	0.66
		di-n-Octylphthalate	20	0.66
		Fluoranthene	10	0.33
		Fluorene	20	0.66
		Hexachlorobenzene	20	0.66
		Hexachlorobutadiene	20	0.66
		Hexachlorocyclopentadiene	20	0.66
		Hexachloroethane	20	0.66
		Indeno (1,2,3-cd) pyrene	20	0.66
		Isophorone	10	0.33
		2-Methyl-4,6-dinitrophenol	20	0.66
		Naphthalene	20	0.66
		Nitrobenzene	20	0.66
		2-Nitrophenol	20	0.66
		4-Nitrophenol	20	0.66
		n-Nitrosodimethylamine	20	0.66
		n-Nitrosodi-n-propylamine	20	0.66
		n-Nitrosodiphenylamine	20	0.66
		Pentachlorophenol	20	0.66
		Phenanthrene	20	0.66
		Phenol	20	0.66
		Pyrene	20	0.66
		1,2,4-Trichlorobenzene	20	0.66
		2,4,6-Trichlorophenol	20	0.66

**Practical Quantitation Limits for Metals
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Parameter	Method	Analyte	Water (µg/l)	Soil (mg/kg)
Metals	SW6010	Antimony	3	3
	SW6010	Arsenic	20	1
	SW6010	Beryllium	4	0.3
	SW6010	Cadmium	4	0.3
	SW6010	Chromium	10	0.6
	SW6010	Copper	20	1
	SW6010	Lead	10	0.6
	SW7470	Mercury	0.5	--
	SW7471	Mercury	--	0.4
	SW6010	Nickel	20	1
	SW6010	Selenium	20	1
	SW6010	Silver	5	0.6
	SW6010	Thallium	2	1
	SW6010	Zinc	50	3

Practical Quantitation Limits for Polychlorinated Biphenyls
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts

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Parameter	Method	Analyte	Aqueous (µg/l)	Soil (mg/kg)
PCBs	SW8081	PCB 1016	10	0.40
	SW8081	PCB 1221	10	0.40
	SW8081	PCB 1232	10	0.40
	SW8081	PCB 1242	10	0.40
	SW8081	PCB 1248	10	0.40
	SW8081	PCB 1254	10	0.40
	SW8081	PCB 1260	10	0.40

**Practical Quantitation Limits for Pesticides
Environmental Monitoring Program
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Westover Air Reserve Base, Chicopee, Massachusetts**

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Parameter	Method	Analyte	Water (µg/l)	Soil (µg/kg)
Pesticides / PCBs	SW8081	Aldrin	0.050	1.7
		alpha-BHC	0.050	1.7
		beta-BHC	0.050	1.7
		gamma-BHC	0.050	1.7
		delta-BHC	0.050	1.7
		Chlordane	0.50	17.0
		4,4'-DDD	0.10	3.3
		4,4'-DDE	0.10	3.3
		4,4'-DDT	0.10	3.3
		Dieldrin	0.10	3.3
		Endosulfan I	0.050	1.7
		Endosulfan II	0.10	3.3
		Endosulfan sulfate	0.10	3.3
		Endrin	0.10	3.3
		Endrin aldehyde	0.10	3.3
		Heptachlor	0.050	1.7
		Heptachlor epoxide	0.050	1.7
		Methoxychlor	0.50	17.0
		Toxaphene	5.0	170.0

Summary of Calibration Procedures for Volatile Organic Compounds by GC/MS
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
SW8260A	Volatile Organic Compounds	Check of instrument tuning criteria using BFB.	Every 12 hours.	Refer to next Table.	1) Retune instrument. 2) Repeat BFB analysis.
		Multipoint calibration (minimum five points) (ICAL).	Initially and as required.	%RSD for CCCs <30%; Minimum Relative Response Factors for SPCC's: Chloromethane 0.10 1,1-dichloromethane 0.10 Bromoform >0.10 Chlorobenzene 0.30 1,1,2,2-tetrachloroethane 0.30	1) Evaluate system. 2) Recalibrate.
		Continuing calibration check standard (CCV).	Every 12 hours.	Same as initial calibration above. Difference <20% for CCCs.	1) Evaluate system. 2) Repeat calibration check. 3) Recalibrate. 4) Reanalyze affected samples.

**Bromofluorobenzene Key Ion Abundance Criteria
for Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
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Mass	Ion Abundance Criteria
50	15% to 40% of mass 95
75	30% to 60% of mass 95
95	Base peak, 100% relative abundance
96	5% to 9% of mass 95
173	< 2% of mass 174
174	> 50% of mass 95
175	5% to 9% of mass 174
176	> 95% but < 101% of mass 174
177	5% to 9% of mass 176

Reference: EPA Test Methods for Evaluating Solid Waste (SW-846), September 1994.

Summary of Calibration Procedures for Semi-Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
Work Plan
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
SW8270B	Semivolatile Organic Compounds	Check of instrument tuning criteria using DFTPP.	Every 12 hours.	Refer to next table.	1) Retune instrument. 2) Repeat DFTPP analysis.
		Multipoint calibration (minimum five points).	Initially and as required.	%RSD for CCCs $\leq 30\%$; Avg. RF ≥ 0.050 for SPCCs.	1) Evaluate system. 2) Recalibrate.
		Continuing calibration check standard (CCV).	Every 12 hours.	RF ≥ 0.050 for SPCCS; % Difference $\leq 30\%$ for CCCs.	1) Evaluate system. 2) Repeat calibration check. 3) Recalibrate. 4) Reanalyze affected samples.

**Decafluorotriphenylphosphine Key Ion Abundance Criteria
for Semi-Volatile Organic Compounds by GC/MS
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Mass	Ion Abundance Criteria
51	30% to 60% of mass 198
68	< 2% of mass 69
69	(reference only)
70	< 2% of mass 69
127	< 40% to 60% of mass 198
197	< 1% of mass 198
198	Base peak, 100% relative abundance
199	5% to 9% of mass 198
275	10% to 30% of mass 198
365	> 1% of mass 198
441	Present but less than mass 443
442	> 40% of mass 198
443	17% to 23% of mass 442

Reference: EPA Test Methods for Evaluating Solid Waste (SW-846), September 1994.

Summary of Calibration Procedures for Total Petroleum Hydrocarbons - VPH/EPH
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
MADEP	VPH/EPH	Multipoint calibration (minimum five points) (ICAL).	Initially and as required.	%RSD $\leq$ 25% or $r^2 \geq 0.99$	1) Evaluate system. 2) Recalibrate.
		Continuing calibration check standard (ICV).	Daily, before sample analysis and every 10 samples	%RPD $\leq$ 25%	1) Evaluate system. 2) Repeat calibration check. 3) Recalibrate. 4) Reanalyze affected samples.

Summary of Calibration Procedures for PCBs
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
SW8082	PCBs	Multipoint calibration (minimum five points) (ICAL).	Initially and as required. (PCBs may be quantitated on an instrument calibrated specifically for PCBs).	%RSD $\pm 20\%$ or $r^2 \geq 0.995$	1) Evaluate system.
		Continuing calibration check standard (ICV) (include PCB 1016, PCB 1260).	Before sample analysis.	$\pm 15\%$ difference from expected concentration.	1) Evaluate system. 2) Repeat calibration standard. 3) Recalibrate. 4) Reanalyze affected samples.
		Calibration check standard (CCV for single component pesticides).	Every 10 analyses and end of sequence (excluding CCVs and instrument blanks).	$\pm 15\%$ difference from expected concentration for each standard bracketing samples.	1) Evaluate system. 2) Reanalyze samples back to the last acceptable CCV. 3) Perform new ICAL as needed.

Summary of Calibration Procedures for Organochlorine Pesticides
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
SW8081	Pesticides	Multipoint calibration (minimum five points) (ICAL).	Initially and as required.	%RSD $\pm 20\%$ or $r^2 \geq 0.995$	1) Evaluate system.
		Continuing calibration check standard (ICV)	Before sample analysis.	$\pm 15\%$ difference from expected concentration.	1) Evaluate system. 2) Repeat calibration standard. 3) Recalibrate. 4) Reanalyze affected samples.
		Calibration check standard (CCV for single component pesticides).	Every 10 analyses and end of sequence (excluding CCVs and instrument blanks).	$\pm 15\%$ difference from expected concentration for each standard bracketing samples.	1) Evaluate system. 2) Reanalyze samples back to the last acceptable CCV. 3) Perform new ICAL as needed.

Summary of Calibration Procedures for Metals by ICP
Environmental Monitoring Program
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
SW6010B	Metals	Multipoint calibration.	Daily	$RSD \leq 2\%$	1) Recalibrate.
		Calibration blank (ICB, CCB).	After initial calibration and after each calibration.	< PQL	1) Clean system. 2) Rerun blank.
		ICP interference check (ICS).	Run at beginning of daily run.	$\pm 20\%$ of true value for EPA check sample elements.	1) Verify calibration. 2) Verify IEC and update as necessary.
		Initial calibration verification (ICV).	After standardization.	$\pm 10\%$ expected response.	1) Reanalyze ICV.
		Contract Required Detection Limit Standard (CFI).	After the ICV, prior to sample analysis.	$\pm 50\%$ expected concentration.	1) Evaluate effect on data.
		Linearity Standard Check.	After the ICV, prior to sample analysis.	$\pm 5\%$ expected concentration.	1) Evaluate the quarterly linear.
		Continuing calibration verification (CCV).	Every 10 samples and end of run sequence.	$\pm 10\%$ expected response.	1) Reanalyze CCV.

**Summary of Calibration Procedures for Mercury by CVAA
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Method	Parameter	Calibration	Frequency	Acceptance Criteria	Corrective Action
SW7470, 7471	Mercury	Multipoint calibration (minimum blank plus five points) (ICAL).	Initially and as required.	$r \geq 0.995$	1) Check calculations. 2) Recalibrate 3) Re-prep standards as needed.
		Initial calibration verification (ICV).	Daily, prior to sample analysis.	$\pm 10\%$ from expected concentration.	1) Check calculations. 2) Reanalyze ICV. 3) Recalibrate as needed.
		Continuing calibration verification (CCV).	After every 10 samples and end of run.	$\pm 20\%$ from expected concentration.	1) Check calculations. 2) Recalibrate (ICV). 3) Reanalyze samples back to last good CCV.
		Calibration blank (ICB, CCB).	After the ICV, CCV.	$< \text{PQL}$	1) Check calculations. 2) Reanalyze affected samples.

**Control Limits for Laboratory Control Samples and
Surrogate Spikes for Volatile Organic Compounds by GC/MS
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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Water	Soil	Water	Soil
SW8260A	Benzene	70-130	70-130	N/A	N/A
	Chlorobenzene	70-130	70-130	N/A	N/A
	1,1-Dichloroethane	70-130	70-130	N/A	N/A
	1,2-Dichloroethane	70-130	70-130	N/A	N/A
	1,1-Dichloroethene	70-130	70-130	N/A	N/A
	cis-1,2-Dichloroethene	70-130	70-130	N/A	N/A
	trans-1,2-Dichloroethene	70-130	70-130	N/A	N/A
	Ethylbenzene	70-130	70-130	N/A	N/A
	Tetrachloroethene	70-130	70-130	N/A	N/A
	Toluene	70-130	70-130	N/A	N/A
	1,1,1-Trichloroethane	70-130	70-130	N/A	N/A
	Trichloroethene	70-130	70-130	N/A	N/A
	Vinyl Chloride	70-130	70-130	N/A	N/A
	p-Xylene	70-130	70-130	N/A	N/A
	m-Xylene	70-130	70-130	N/A	N/A
	o-Xylene	70-130	70-130	N/A	N/A
	Surrogates:				
	Dibromofluoromethane	86-118	80-120	N/A	N/A
	Toluene-d8	88-110	81-117	N/A	N/A
	4-Bromofluorobenzene	86-115	74-121	N/A	N/A
	1,2-Dichloroethane-d4	80-120	80-120	N/A	N/A

Note: The control limits listed above may be revised with the contracted laboratory's most recently updated quarterly historical control limits subject to approval by the Installation RPM.

**Control Limits for Matrix Spikes, Matrix Spike Duplicates,
and Surrogate Spikes for Volatile Organic Compounds by GC/MS
Environmental Monitoring Program**

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Westover Air Reserve Base, Chicopee, Massachusetts**

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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Groundwater	Soil	Groundwater	Soil
SW8260A	Benzene	76-127	66-142	11	21
	Chlorobenzene	75-130	60-133	13	21
	1,1-Dichloroethane	65-135	60-140	14	22
	1,2-Dichloroethane	65-135	60-140	14	22
	1,1-Dichloroethene	61-145	59-172	14	-
	cis-1,2-Dichloroethene	65-135	60-140	14	22
	trans-1,2-Dichloroethene	65-135	60-140	14	22
	Ethylbenzene	65-135	60-140	14	22
	Tetrachloroethene	65-135	60-140	14	22
	Toluene	76-125	59-139	13	21
	1,1,1-Trichloroethane	65-135	60-140	14	22
	Trichloroethene	71-120	62-137	14	22
	Vinyl Chloride	65-135	60-140	14	22
	p-Xylene	65-135	60-140	14	22
	m-Xylene	65-135	60-140	14	22
	o-Xylene	65-135	60-140	14	22
					22
	Surrogates:				22
	Dibromofluoromethane	86-118	80-120	N/A	N/A
	Toluene-d8	88-110	81-117	N/A	N/A
	4-Bromofluorobenzene	86-115	74-121	N/A	N/A
	1,2-Dichloroethane-d4	80-120	80-120	N/A	N/A

Note: The control limits listed above may be revised with the contracted laboratory's most recently updated quarterly historical control limits subject to approval by the Installation RPM.

**Control Limits for Matrix Spike, Matrix Spike Duplicates, Surrogate Spikes, and
Laboratory Control Samples for Total Petroleum Hydrocarbons by GC
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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Water	Soil	Water	Soil
SW8100 Mod	Diesel	50-150	50-150	50	50
	Surrogates: o-Terphenyl	50-150	50-150	N/A	N/A
MADEP VPH	Component Spike	70-130	70-130	N/A	N/A
	Surrogates: Bromofluorobenzene	70-130	70-130	N/A	N/A
MADEP EPH	Component Spike	40-140	40-140	N/A	N/A
	Surrogates: Chloro-octadecane	40-140	40-140	N/A	N/A
	o-Terphenyl	40-140	40-140	N/A	N/A

Note: The control limits listed above may be revised with the contracted laboratory's most recently updated quarterly historical control limits subject to approval by the Installation RPM.

**Control Limits for Laboratory Control Samples and
Surrogate Spikes for Semi-Volatile Organic Compounds by GC/MS
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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Water	Soil	Water	Soil
SW8270B	Acenaphthene	65-135	65-135	20	35
	2-Chlorophenol	65-135	65-135	20	35
	4-Chloro-3-methylphenol	65-135	65-135	20	35
	1,4-Dichlorobenzene	65-135	65-135	20	35
	2,4-Dinitrotoluene	65-135	65-135	20	35
	4-Nitrophenol	65-135	65-135	20	35
	N-nitroso-di-n-prop	65-135	65-135	20	35
	Pentachlorophenol	65-135	65-135	20	35
	Phenol	65-135	65-135	20	35
	Pyrene	65-135	65-135	20	35
	1,2,4-Trichlorobenzene	65-135	65-135	20	35
	Surrogates:				
	2-Fluorobiphenyl	65-135	65-135	N/A	N/A
	2-Fluorophenol	65-135	65-135	N/A	N/A
	Nitrobenzene-d5	65-135	65-135	N/A	N/A
	Phenol-d5	65-135	65-135	N/A	N/A
	Terphenyl-d14	65-135	65-135	N/A	N/A
	2,4,6-Tribromophenol	65-135	65-135	N/A	N/A

**Control Limits for Matrix Spikes, Matrix Spike Duplicates, Surrogate Spikes
and Laboratory Control Samples for Semi-Volatile Organic Compounds
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Westover Air Reserve Base, Chicopee, Massachusetts

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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Water	Soil	Water	Soil
SW8270B	Acenaphthene	65-135	65-135	20	35
	2-Chlorophenol	65-135	65-135	20	35
	4-Chloro-3-methylphenol	65-135	65-135	20	35
	1,4-Dichlorobenzene	65-135	65-135	20	35
	2,4-Dinitrotoluene	65-135	65-135	20	35
	4-Nitrophenol	65-135	65-135	20	35
	N-nitroso-di-n-prop	65-135	65-135	20	35
	Pentachlorophenol	65-135	65-135	20	35
	Phenol	65-135	65-135	20	35
	Pyrene	65-135	65-135	20	35
	1,2,4-Trichlorobenzene	65-135	65-135	20	35
	Surrogates:				
	2-Fluorobiphenyl	65-135	65-135	N/A	N/A
	2-Fluorophenol	65-135	65-135	N/A	N/A
	Nitrobenzene-d5	65-135	65-135	N/A	N/A
	Phenol-d5	65-135	65-135	N/A	N/A
	Terphenyl-d14	65-135	65-135	N/A	N/A
	2,4,6-Tribromophenol	65-135	65-135	N/A	N/A

**Control Limits for Laboratory Control Samples for Metals
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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Aqueous	Soil	Aqueous	Soil
SW6010	Antimony	75-125	75-125	20	20
SW6010	Arsenic	75-125	75-125	20	20
SW6010	Beryllium	75-125	75-125	20	20
SW6010	Cadmium	75-125	75-125	20	20
SW6010	Chromium	75-125	75-125	20	20
SW6010	Copper	75-125	75-125	20	20
SW6010	Lead	75-125	75-125	20	20
SW7470	Mercury	80-120	--	20	20
SW7471	Mercury	--	80-120	--	--
SW6010	Nickel	75-125	75-125	20	20
SW6010	Selenium	75-125	75-125	20	20
SW6010	Silver	75-125	75-125	20	20
SW6010	Thallium	75-125	75-125	20	20
SW6010	Zinc	75-125	75-125	20	20

Note: The control limits listed above may be revised with the contracted laboratory's most recently updated quarterly historical control limits subject to approval by the Installation RPM.

Control Limits for Matrix Spikes and Matrix Spike Duplicates for Metals
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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Aqueous	Soil	Aqueous	Soil
SW6010	Antimony	75-125	75-125	20	20
SW6010	Arsenic	75-125	75-125	20	20
SW6010	Beryllium	75-125	75-125	20	20
SW6010	Cadmium	75-125	75-125	20	20
SW6010	Chromium	75-125	75-125	20	20
SW6010	Copper	75-125	75-125	20	20
SW6010	Lead	75-125	75-125	20	20
SW7470	Mercury	75-125	--	20	--
SW7471	Mercury	--	75-125	--	20
SW6010	Nickel	75-125	75-125	20	20
SW6010	Selenium	75-125	75-125	20	20
SW6010	Silver	75-125	75-125	20	20
SW6010	Thallium	75-125	75-125	20	20
SW6010	Zinc	75-125	75-125	20	20

Note: The control limits listed above may be revised with the contracted laboratory's most recently updated quarterly historical control limits subject to approval by the Installation RPM.

**Control Limits for Matrix Spikes, Matrix Spike Duplicates, Surrogate Spikes
and Laboratory Control Samples for PCBs
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Analytical Method	Spiking Compounds	Percent Recovery (%)		Relative Percent Difference (%)	
		Aqueous/TCLP Extract	Soil	Aqueous/TCLP Extract	Soil
SW8082	Aroclor 1254	67-127	41-167	20	20
	Surrogates:				
	Decachlorobiphenyl	60-150	38-152	N/A	N/A
	Tetrachloro-m-xylene	40-110	49-136	N/A	N/A

Notes:

The control limits listed above are the laboratory's current limits.

Summary of Internal Quality Control Procedures for Volatile Organic Compounds by GC/MS
Environmental Monitoring Program
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Westover Air Reserve Base, Chicopee, Massachusetts

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Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
SW8260A	Volatile Organic Compounds	Method blank	1 per batch, not to exceed 20 samples	< MDL	1) Check calculations. 2) Reanalyze blank. If passes, report. 3) If sample results ND, no action. 4) If sample results > 10x blank concentration, no action. 5) If sample results < 10x blank concentration, re-extract/reanalyze affected samples 6) Report blank results down to the MDL.
		Instrument blank	As required	< PQL	1) Run until system is clean.
		Matrix spike(MS)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Evaluate impact on data (4x rule). Evaluate batch for adverse trends. 3) If no interference is evident, re-extract/reanalyze MS/MSD once. 4) Narrate any outliers.
		Matrix spike duplicate (MSD)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Evaluate impact on data (4x rule). Evaluate batch for adverse trends. 3) Evaluate sample homogeneity. 4) If no apparent inhomogeneity is present, re-extract/reanalyze MS/MSD once. 5) Narrate any outliers
		Surrogate spike	Every sample, including QC	Refer to Appendix C	1) Check calculations. 2) Evaluate batch for adverse trends. 3) If no interference is evident, re-extract/reanalyze MS/MSD once. 4) Narrate any outliers.
		Internal standard (IS)	Every continuing calibration standard	Retention time must be within 30 sec of continuing calibration verification (CCV); IS area in the sample must be a factor of 2 of the IS in the CCV	1) Check sensitivity of instrument and sample. 2) Evaluate all data. 3) Reanalyze sample or standard once. 4) Narrate any outliers.
		Laboratory control sample (LCS)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Reanalyze LCS. If passes, report. 3) Reanalyze samples as needed. 4) Narrate any outliers.

**Summary of Internal Quality Control Procedures for Total Petroleum Hydrocarbons
Environmental Monitoring Program
Work Plan
Westover Air Reserve Base, Chicopee, Massachusetts**

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Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
MADEP	VPH/EPH	Method blank	1 per batch, not to exceed 20 samples	< MDL	1) Check calculations. 2) Reanalyze blank. If passes, report. 3) If sample results ND, no action. 4) If sample results >10x blank concentration, no action. 5) If sample results <10x blank concentration, re-extract/reanalyze affected samples. 6) Report blank results down to the MDL.
		Instrument blank	As required	< PQL	1) Run until system is clean. 2) Bake-out system. 3) Perform maintenance. 4) Evaluate LCS/LCSD
		Matrix spike (MS)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Evaluate impact on data (4x rule). Evaluate batch for adverse trends. 3) If no interference is present, re-extract/reanalyze MS/MSD.
		Matrix spike duplicate (MSD)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Evaluate sample homogeneity. 3) If no apparent inhomogeneity is present, re-extract/reanalyze MS/MSD. 4) Evaluate LCS/LCSD
		Surrogate spike	Every sample, including QC	Refer to Appendix C	1) Check calculations, standards, and system. 2) Evaluate impact on data (4x rule). 3) Evaluate batch for adverse trends. 4) Reanalyze once. 5) If not acceptable, re-extract/reanalyze sample.
		Laboratory control sample (LCS) and LCD duplicate (LCSD)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Reanalyze LCS. If passes, report. 3) Reprep samples. 4) Narrate any outliers.

Summary of Internal Quality Control Procedures for Semi-Volatile Organic Compounds by GC/MS
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Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
SW8270B	Semivolatile Organic Compounds	Method blank	1 per batch, not to exceed 20 samples.	< MDL	1) Check calculations. 2) Reanalyze blank. If passes, report. 3) If sample results ND, no action. 4) If sample results >10x blank concentration, no action. 5) If sample results <10x blank concentration, re-extract/reanalyze affected samples. 6) Report blank results down to MDL.
		Instrument blank	As required	< PQL	1) Run until system is clean.
		Matrix spike (MS)	1 per batch, not to exceed 20 samples.	Refer to Appendix E	1) Check calculations. 2) Evaluate impact on data (4x rule). 3) Evaluate batch for adverse trends. 4) If no interference is present, re-extract/reanalyze MS/MSD.
		Matrix spike duplicate (MSD)	1 per batch, not to exceed 20 samples.	Refer to Appendix E	1) Check calculations. 2) Evaluate sample homogeneity. 3) If no apparent inhomogeneity is present, re-extract/reanalyze MS/MSD. 4) Narrate any outliers.

Summary of Internal Quality Control Procedures for Semi-Volatile Organic Compounds by GC/MS
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Westover Air Reserve Base, Chicopee, Massachusetts

Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
		Surrogate spike	Every sample, including QC	Refer to Appendix E	1) Check calculations, standards, and system. 2) Evaluate batch for adverse trends. 3) Reanalyze once. 4) Re-extract if maximum 2- or 1-surrogate per fraction is outside limits; or if percent recovery <10 percent. 5) Narrate any outliers.
		Internal standard (IS)	Continuing calibration standard and every sample	Retention time must be within 30 sec of continuing calibration verification (CCV); IS area in the sample must be within a factor of 2 of the IS in the CCV	1) Check sensitivity of instrument. 2) Evaluate all data. 3) Reanalyze sample or standard. 4) Narrate any outliers.
		Laboratory control sample (LCS)	1 per batch, not to exceed 20 samples.	Refer to Appendix E	1) Check calculations. 2) Reanalyze LCS. If passes, report. 3) Reprep samples. 4) Narrate any outliers.

Summary of Internal Quality Control Procedures for Metals by ICP
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Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
SW6010B	Metals	Method blank	1 per batch, not to exceed 20 samples	< MDL	1) Check calculations. 2) Reanalyze blank. If passes, report. 3) If sample results ND, no action. 4) If sample results > 10x blank concentration, no action. 5) If sample results <10x blank concentration, re-extract/reanalyze affected 6) Report blank results down to the MDL.
		Matrix spike (MS) and duplicate sample	1 per batch, not to exceed 20 samples	1 per batch, Refer to Appendix C	1) Check calculations. 2) Assess impact on data (4x rule). 3) Reanalyze once. 4) If fails, perform post-digestion spike on unspiked sample. 5) If post-spike percent recovery is not within limits, flag, narrate, stop. 6) If post spike is within limits, perform serial dilution of MS. 7) If serial dilution percent recovery within limits, flag, narrate, stop. 8) Redigest MS and sample if post-spike is within limits and serial dilution is outside limits.
		Laboratory control sample (LCS)	1 per batch, not to exceed 20 samples	1 per batch, Refer to Appendix C	1) Check calculations. 2) Reanalyze LCS. If passes report. 3) Re-extract/reanalyze samples as necessary. 4) Narrate any outliers.

**Summary of Internal Quality Control Procedures for Mercury by CVAA
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Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
SW7470 SW7471	Mercury	Method blank	1 per batch, not to exceed 20 samples	< MDL	1) Check calculations. 2) Reanalyze blank. If passes, report. 3) If sample results ND, no action. 4) If sample results >10x blank concentration, no action. 5) If sample results <10x blank concentration, re-extract/reanalyzed affected 6) Report blank results down to the MDL.
		Matrix spike (MS) and sample duplicate	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Assess data (4x rule). 3) Reanalyze once. If confirms, report both sets of data. 4) Re-digest MS if results do not confirm. 5) Narrate outliers.
		Laboratory control sample (LCS)	1 per batch, not to exceed 20 samples	Refer to Appendix C	1) Check calculations. 2) Reanalyze LCS. If passes, report. 3) Reprep samples as necessary. 4) Narrate any outliers.

**Summary of Internal Quality Control Procedures for PCBs and Pesticides
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Westover Air Reserve Base, Chicopee, Massachusetts**

Page 1 of 1

Method	Parameter	QC Element	Frequency	Acceptance Criteria	Corrective Action
SW8081/ 8082	Pesticides/ PCBs	Method blank	1 per batch, not to exceed 20 samples	< MDL	1) Check calculations. 2) Reanalyze blank; if passes, report. 3) If sample results ND, no action. 4) If sample results >10x blank concentration, no action. 5) If sample results <10x blank concentration, re-extract/reanalyze affected samples. 6) Report blank results down to MDL.
		Instrument blank	As required	< PQL	1) Run until system is clean. 2) Bake-out system. 3) Perform maintenance.
		Matrix spike (MS)	1 per batch, not to exceed 20 samples	Refer to Appendix D	1) Check calculations. 2) Evaluate impact on data (4x rule). Evaluate batch for adverse trends. 3) If no interference is present, re-extract/reanalyze MS/MSD. 4) Narrate any outliers.
		Matrix spike duplicate (MSD)	1 per batch, not to exceed 20 samples	Refer to Appendix D	1) Check calculations. 2) Evaluate sample homogeneity. 3) If no apparent inhomogeneity is present, re-extract/reanalyze MS/MSD. 4) Narrate any outliers.
		Surrogate spike	Every sample, including QC	Refer to Appendix D	1) Check calculations standards and system. 2) If both surrogates exceed limits, evaluate impact on data (4x rule). 3) Reanalyze once. If within control, report. 4) Evaluate batch for adverse trends. 5) If not acceptable, re-extract/reanalyze sample. 6) Narrate any outliers.
		Laboratory control sample (LCS)	1 per batch, not to exceed 20 samples	Refer to Appendix D	1) Check calculations. 2) Reanalyze LCS (if passes, report). 3) Reprep samples. 4) Narrate any outliers.

NOTE FROM ARCHIVIST:

The Following 4 pages , titled “Montgomery Watson’s Response to Comments “ were not bound in this original document. They were stapled together and found slipped between the last page and back cover.

Based on the dates and file locations found in the metadata of the page footers, I do not think these comments were intended to be included as part of the official published report.

I am including them nonetheless with this disclaimer.

**Montgomery Watson's Response to Comments
Draft Work Plan
Installation-Wide Environmental Monitoring Program
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Provided below are the review comments (in *italic*) followed by Montgomery Watson's response to each comment.

A. Mike Klug's Comments - 30 June 1998

1. *Page 1-1, second bullet on page: Suggest changing text to read "Close existing data gaps..".*

The second bullet in Section 1.1 was revised to read "Close existing data gaps...".

2. *Page 1-3, section 1.3: It is noted that sites 10, 14 and 18 are not included in this effort. I seem to recall that these sites were supposed to be included. Can anyone refresh my memory as to why these sites dropped out of the process?*

The Incinerator Landfill B Site OT-10 and Incinerator Site OT-14 will be addressed as part of the work being conducted at the Christmas Tree Fire Training Area as stated in the Supplemental Sampling, Phase II/Remedial Investigation Work Plan approved by MADEP on 2 July 1998. These sites do not have any associated monitoring wells. Therefore, the groundwater and soil data collected through the completion of the Phase II/RI at FT-03 will be used to assess these sites. Additionally, Building 9000 (SS-18) was not included in this work plan because the groundwater sampling is planned as part of the RAM project. Therefore, these sites were not included in the list in Section 1.3.

3. *Page 1-7, section 1.3.7: Please clarify/verify if text here "site continues to be used for disposal" is correct. If so, it sounds like the base is operating and continues to operate an illegal landfill.*

The Construction Rubble Landfill Site is no longer being used for disposal of construction material, soil, and landscaping wastes, as stated in Section 1.3.7. The second paragraph in Section 1.3.7 was revised to correctly state the current status of the Site.

4. *Page 2-1, section 2.0: Contractor needs to be sure that official notice is submitted to MADEP as well the prior site LSP to make sure everyone is clear who the "LSP of record" for the subject sites is.*

Montgomery Watson will instruct Mr. Kevin Sheehan to submit notice to the MADEP as the "LSP of record" for the subject sites. No official notice was delivered to MADEP from the former consultant, URS Greiner.

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5. *Page 2-4, section 2.1.2: Text here (and in tables 2-2 and 2-3) seem to indicate that wells A-3/3A will be sampled for both sites LF-02 and RW-04. Is this correct? Collection of two rounds of samples from this one well is unnecessary. Also, would suggest that wells B17/17A and B19/19A also be sampled for VOCs due to their proximity to the landfill A site. Finally, change text in second paragraph to make it clear that wells are not located "within" the location of the former waste vault.*

The samples collected from wells A-3/3A will be analyzed for TPH-VPH/EPH, VOCs, and total and dissolved PP metals, as stated in Section 2.1.1 for Landfill A, and for gross alpha, gross beta, and gross gamma radiation, as stated in Section 2.1.2 for the Low-Level Radioactive Waste Site. Therefore, the well couplet will only be sampled for one round. Landfill B (LF-01) was not included in this work plan. The sampling at Landfill B will be conducted prior to the cap installation in 1999 as part of the capping project. Therefore, wells B-17/17A and B-19/19A were not selected for sampling of VOCs. If requested, the work plan will be revised to include analyzing for VOCs at these wells. Additionally, the second sentence in the second paragraph was revised to read "...upgradient, downgradient, or adjacent to the former source area...".

6. *Page 2-5, section 2.1.4, second paragraph: Text here regarding the location of the samples to be collected for cyanide analysis ("near the Imhoff tanks") does not match the locations shown on figure 2-2.*

The fourth sentence in the second paragraph of Section 2.1.4 was revised to read "Six of the 14 soil samples collected at the former Sewage Treatment Plant Site will be analyzed for cyanide."

7. *Page 2-9, section 2.1.11: Figure 2-8 referenced here does not show the proposed locations of the surface water / sediment samples at the site.*

Based on discussions held with Cyndi Pawloski of the MADEP and Westover ARB, the collection of surface water/sediment samples from Ingraham Brook will be removed from the scope of work. The MADEP does not require Westover ARB to continue to monitor the Brook. Therefore, Section 2.1.11 was revised to respond to this discussion.

**Montgomery Watson's Response to Comments
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B. Westover ARB Comments - 17 July 1998

1. *p. 1-7 1st line should read "...Westover ARB reported a release of approximately 20 gallons of lubricating oil from a filter tank."*

The fourth sentence in the second paragraph of Section 1.3.5 on page 1-7 was revised to read "...Westover ARB reported a release of approximately 20 gallons of lubricating oil from a filter tank."

2. *p. 1-10 Section 1.3.11 Building 9200 (SS-17): Include that Buildings 9200, 9201, and 9202 were demolished in 1997 and the demolition material was removed from the site.*

The sentence "Buildings 9200, 9201, and 9202 were demolished and removed from the site in 1997." was added to the end of the second paragraph in Section 1.3.11.

3. *p. 1-10 Section 1.3.13 should read: "Former Service Station, Building 1601 (SS-20)". 1st line should read, "The former Service Station..."*

Section 1.3.13 was renamed "Former Service Station, Building 1601 (SS-20)". The first sentence in Section 1.3.13 was revised to read "The former Service Station..."

4. *p. 2-2 7th par., delete collection of "two surface water/sediment samples from Ingraham Brook" at site SS-17.*

The phrase "...and two surface water/sediment samples from Ingraham Brook" was deleted from the eleventh bullet in Section 2.1. Additionally, Section 2.1.11 was revised to delete surface water/sediment sampling. See Response to HQ AFRC Comment No. 7.

5. *pp. 2-9, 2-10 Building 9200 (SS-17): Delete references to surface water/sediment sampling.*

See Response to HQ AFRC Comment No. 7. References to surface water/sediment sampling in Section 2.1.11 were removed.

6. *Fig. 1-12 Delete "Old PX Bldg." This building no longer exists.*

The "Old PX Bldg." was deleted from Figures 1-12 and 2-9.

Montgomery Watson's Response to Comments
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7. *Table 2-12 Delete Summary of Chemical Analyses for "Surface Water" and "Sediment" samples at site SS-17.*

Surface water and sediment sample analyses were removed from Table 2-12.